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Search Results -

Terms	Documents
(5850554 5226162 5649207 5940617 6003143 6016474 6026362 4782461 5257269 5704034 5717851 5737516 5964893 6026501 6035422 6324683 5892941 6219782 6219782 5764989 5848274 6412106 5964890 6011916 6185578 5859963 6131185 6282699 6249882 5872909 5630052 6058333 5253158 5560036 6026235 6106571 6106572 6145123 5784552 6126328 6058393 5295222 5513317 5870607 5903719 5961641 5983018 6173395 6178547 6209045).pn.	49

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- Derwent World Patents Index
- IBM Technical Disclosure Bulletins

Search: L4

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Search History

DATE: Monday, May 03, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT; PLUR=NO; OP=OR		
L4	(5850554 5226162 5649207 5940617 6003143 6016474 6026362 4782461 5257269 5704034 5717851 5737516 5964893 6026501 6035422 6324683 5892941 6219782 6219782 5764989 5848274 6412106 5964890 6011916 6185578 5859963 6131185 6282699 6249882 5872909 5630052 6058333 5253158 5560036 6026235 6106571 6106572 6145123 5784552 6126328 6058393 5295222 5513317 5870607 5903719 5961641 5983018 6173395 6178547 6209045).pn.	49	L4
L3	L2 AND calls	5	L3
L2	L1 AND breakpoint and script	6	L2
L1	717/124.ccls.	231	L1

Hit List

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Search Results - Record(s) 1 through 11 of 11 returned.

☐ 1. Document ID: US 6412106 B1

L5: Entry 1 of 11 File: USPT Jun 25, 2002

US-PAT-NO: 6412106
DOCUMENT-IDENTIFIER: US 6412106 B1

TITLE: Graphical system and method for debugging computer programs

DATE-ISSUED: June 25, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Leask; Gary M.	Dallas	TX		
Huffman; Dale L.	Allen	TX		

US-CL-CURRENT: 717/124; 717/125, 717/148

ABSTRACT:

A system and method for graphically debugging a computer program is disclosed. In a preferred embodiment, a graphical debugging environment is provided, which is capable of displaying a graphical representation of an application program to be debugged. Thereafter, the graphical debugging environment allows a user to insert debugging tools, such as breakpoints, directly into the graphical representation of the application program. Thus, a user is not required to interact with the textual source code of an application program when debugging it. The graphical debugging environment may display indicators illustrating where debug tools have been inserted within the application program. In a preferred embodiment, the graphical debugging environment allows a user to perform debugging during an application program's runtime. Thus, a user is not required to halt an application program prior to debugging it. Also, in a preferred embodiment the graphical debugging environment executing on a local computer may be used to debug an application program residing on a remote computer.

52 Claims, 9 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 7

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 2. Document ID: US 6324683 B1

L5: Entry 2 of 11 File: USPT Nov 27, 2001

US-PAT-NO: 6324683
DOCUMENT-IDENTIFIER: US 6324683 B1
**** See image for Certificate of Correction ****

TITLE: System, method and program for debugging external programs in client/server-based relational database management systems

DATE-ISSUED: November 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fuh; You-Chin Gene	San Jose	CA		
Meier; Michael Stephen	Newark	CA		
Pan; Hsin	San Jose	CA		

US-CL-CURRENT: 717/124

ABSTRACT:

The present invention provides a method, system, and program for debugging external programs, such as user-defined functions, stored procedures, and triggers executed in relational database management systems (RDBMS), in a client-server, i.e., distributed, environment. In the present invention, a debugger is initiated from within a process running the external program by executing a special segment of code prior to the execution of the external program. In one embodiment of the invention, this debugging function is triggered by including a variation of this special segment of program code within the external program, itself. In another embodiment of the invention, this debugging triggering function is provided within an enhanced RDBMS with extensions to SQL to activate the debugging ability in the RDBMS. The invention can be implemented by using present day serial debuggers or parallel and/or distributed debuggers. One such parallel and distributed debugger utilized in a preferred embodiment is the Parallel and Distributed Dynamic Analyzer (PDDA) debugger. In addition, although the following invention is described with reference to a debugger, the invention can be applicable for any application development tool.

19 Claims, 17 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 16

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. De

☐ 3. Document ID: US 6219782 B1

L5: Entry 3 of 11 File: USPT Apr 17, 2001

US-PAT-NO: 6219782
DOCUMENT-IDENTIFIER: US 6219782 B1
**** See image for Certificate of Correction ****

TITLE: Multiple user software debugging system

DATE-ISSUED: April 17, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Khan; Azeemullah	Redmond	WA		
Noyama; Glenn T.	Kirkland	WA		
Pennell; Andrew Michael	Redmond	WA		

US-CL-CURRENT: 712/227; 709/203

ABSTRACT:

A minimally intrusive debugging system for use by multiple users for concurrently and independently debugging a common software target in a client and server debugging environment. The target software is a non-compiled interpreted script-type program that is individually controlled by independent client debugging sessions. Each debug engine in the client's debugging session is used to control the target software program using debug system library interface calls that are integrated into the executing target software program. The debug system library interface calls facilitate communication of target system program events to the client's debug engine and to extract internal operational information from said target software program by the client debug engine and target software program interface on each client computing device.

24 Claims, 6 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 5

☑ 4. Document ID: US 6178547 B1

L5: Entry 4 of 11 File: USPT Jan 23, 2001

US-PAT-NO: 6178547
DOCUMENT-IDENTIFIER: US 6178547 B1

TITLE: Method and apparatus for generating non-redundant symbolic debug information in computer programs

DATE-ISSUED: January 23, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Pennello; Tom	Santa Cruz	CA		

US-CL-CURRENT: 717/124; 717/162

ABSTRACT:

A single copy of symbolic debug information is generated and given a name. The name is derived from the name of the High Level Language construct for which symbolic

debug information must be generated. All references to the symbolic debug information are through that name. Standard linker technology is used to connect the references to the single named copy. How to identify a single source module to contain particular symbolic debug information is also disclosed.

6 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 3

☐ 5. Document ID: US 6058393 A

L5: Entry 5 of 11 File: USPT May 2, 2000

US-PAT-NO: 6058393
DOCUMENT-IDENTIFIER: US 6058393 A

TITLE: Dynamic connection to a remote tool in a distributed processing system environment used for debugging

DATE-ISSUED: May 2, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Meier; Michael Stephen	Newark	CA		
Pan; Hsin	San Jose	CA		

US-CL-CURRENT: 707/10; 714/38, 714/45, 717/124, 718/100

ABSTRACT:

The present invention provides a dynamic connection for distributed applications that need to locate application development tools, including but not limited to debuggers, trace collection tools, compilers, etc.) which may be running on different machines, and to send the tools messages. The program requesting debugging service (i.e., a debugger client) sends, to a tool locator, criteria which specifies the properties of a desired debugger. The tool locator maintains a registry of all tools, e.g. debuggers, and their properties, which remain active within the network by receiving tool registration information from each tool as it is started on any machine within the network. When a message is received by the tool locator from a debugger client specifying the criteria of a desired debugger, the tool locator searches its registry and returns a list of debuggers matching the specified properties along with a communication endpoint address that can be used to establish a connection with a debugger meeting the criteria. The debugger client then sends a message, using the established connection, to the desired debugger

requesting debugging services on behalf of the debugger client or another program. As a result, a dynamic connection is made, at run time, between an application program and a debugger having certain desired properties wherein the debugger may be active, if at all, at any time on any machine within the network.

30 Claims, 9 Drawing figures
Exemplary Claim Number: 1

Number of Drawing Sheets: 9

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☑ 6. Document ID: US 6026235 A

L5: Entry 6 of 11 File: USPT Feb 15, 2000

US-PAT-NO: 6026235
DOCUMENT-IDENTIFIER: US 6026235 A

TITLE: System and methods for monitoring functions in natively compiled software programs

DATE-ISSUED: February 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Shaughnessy; Steven T.	Scotts Valley	CA		

US-CL-CURRENT: 717/127; 717/130

ABSTRACT:

A development system having a monitor/profiler tool for monitoring functions in natively compiled software programs is described. According to the present invention, the monitor/profiler tool is constructed to work directly on a natively compiled software application which only have debugging info. Unlike prior approaches, the monitor/profiler tool does not require a special compile or link phase for the application under exam. The tool can monitor any function in software application which has debug info, thus relieving program developers from the burden of maintaining two ways of building an application. The developer can simply use the same executable for both development and function analysis.

12 Claims, 7 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 6

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 7. Document ID: US 5892941 A

L5: Entry 7 of 11 File: USPT Apr 6, 1999

US-PAT-NO: 5892941
DOCUMENT-IDENTIFIER: US 5892941 A

TITLE: Multiple user software debugging system

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Khan; Azeemullah	Redmond	WA		
Noyama; Glenn T.	Kirkland	WA		
Pennell; Andrew Michael	Redmond	WA		

US-CL-CURRENT: 703/22

ABSTRACT:

A minimally intrusive debugging system for use by multiple users for concurrently and independently debugging a common software target in a client and server debugging environment. The target software is a non-compiled interpreted script-type program that is individually controlled by independent client debugging sessions. Each debug engine in the client's debugging session is used to control the target software program using debug system library interface calls that are integrated into the executing target software program. The debug system library interface calls facilitate communication of target system program events to the client's debug engine and to extract internal operational information from said target software program by the client debug engine and target software program interface on each client computing device.

18 Claims, 6 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 5

☐ 8. Document ID: US 5859963 A

L5: Entry 8 of 11 File: USPT Jan 12, 1999

US-PAT-NO: 5859963
DOCUMENT-IDENTIFIER: US 5859963 A

TITLE: Method and apparatus for optimizing time and testing of higher level language program

DATE-ISSUED: January 12, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
O'Dowd; Daniel D.	Santa Barbara	CA		
Kleidermacher; David N.	Santa Barbara	CA		

US-CL-CURRENT: 714/38

ABSTRACT:

A method for time use analysis of a higher level language program is performed by displaying source code lines in descending order according to the amount of time spent by the program to execute machine code into which the source code lines have

been compiled. Source code lines are displayed arranged in order according to the percentages of the amounts of time spent in execution during runs of the program, and the higher percentages identified for optimizing actions. A digital processing apparatus for performing the analysis includes a display for showing the source code lines that require the most time of execution, a selection apparatus for selecting those source code lines having the greater opportunity for significant corrective action, and displaying the various selected source code lines in the order in which the lines are kept in the program along with the corresponding time spent by the program to execute machine code into which the source code lines have been compiled. An improved method and apparatus identifies source code lines which a testing program does not test in its test procedure. A digital processing apparatus displays in different orders those source code lines identified as not having been used. Test programs are improved so that machine code instructions for all lines of source code are executed.

89 Claims, 10 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 8

☐ 9. Document ID: US 5848274 A

L5: Entry 9 of 11 File: USPT Dec 8, 1998

US-PAT-NO: 5848274
DOCUMENT-IDENTIFIER: US 5848274 A

TITLE: Incremental byte code compilation system

DATE-ISSUED: December 8, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hamby; John	Issaquah	WA		
Gustafsson; Niklas	Bellevue	WA		
Lau; Patrick	Renton	WA		

US-CL-CURRENT: 717/153; 717/118, 719/331

ABSTRACT:

An incremental byte code compiler which provides a high-performance execution environment for dynamically linked languages and for distributed target-independent applications. The execution environment provided by the present invention includes an incremental byte code compiler for generating IL symbols and code objects from a byte code source file, a persistent symbol table for storing the IL symbols and code objects, and an incremental imager for dynamically forming the image of the program from the code objects. The present invention further provides an extremely efficient methodology for dynamically adding program elements to a program under execution.

6 Claims, 23 Drawing figures
Exemplary Claim Number: 1

Number of Drawing Sheets: 14

☐ 10. Document ID: US 5784552 A

L5: Entry 10 of 11 File: USPT Jul 21, 1998

US-PAT-NO: 5784552
DOCUMENT-IDENTIFIER: US 5784552 A

TITLE: Debugging a computer program by simulating execution forwards and backwards in a main history log and alternative history logs

DATE-ISSUED: July 21, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bishop; John E.	Nashua	NH		
Carignan; Donald A.	Tyngsboro	MA		

US-CL-CURRENT: 714/38

ABSTRACT:

A computer program is executed in a forward direction to create a current state of registers and memory for the program. During the forward execution of the program, the pre-existing values of registers and memory changed by each instruction are recorded in a main log. During interactive debugging, reverse execution is simulated by displaying the contents of specified registers or memory locations. For each specified register or memory location, the main log is searched in a forward direction beginning at a specified time in the past and continuing until a value is found, or until the end of the main log is reached and a value is taken from the current state for the computer program. After simulated execution in reverse, the user may specify a changed value for a specified register or memory location, and then forward instruction interpretation is begun using the changed value, without changing the current state. New values of registers and memory locations generated by forward interpretation are recorded in an alternative log. Values of registers and memory accessed by forward-interpreted instructions are fetched by first searching the alternative log in a reverse direction, and when a value is not found in the alternative log, the main log is searched in a forward direction as described above. Moreover, at any time during forward interpretation, the user may specify a changed value, the change is logged in an alternative log, and forward interpretation continues.

22 Claims, 32 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 29

☐ 11. Document ID: US 5764989 A

L5: Entry 11 of 11 File: USPT Jun 9, 1998

US-PAT-NO: 5764989
DOCUMENT-IDENTIFIER: US 5764989 A

TITLE: Interactive software development system

DATE-ISSUED: June 9, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gustafsson; Niklas	Bellevue	WA		
Hamby; John	Issaquah	WA		
Lau; Patrick	Renton	WA		

US-CL-CURRENT: 717/129; 717/140

ABSTRACT:

An interactive program development system which replaces compilers, linkers and debuggers required for conventional software development. The present invention comprises a new program compilation system for producing a novel type of translated structure called a code object, and an Incremental Image which forms the program image from code objects and their respective intermediate language symbols stored in a persistent symbol table. The new program compilation system operates on conventional computers having a CPU, monitor, memory system and input devices. The present invention obviates the need to halt execution of a program under development or during maintenance update to correct programming errors.

17 Claims, 22 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 13

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L4 AND (symbol ADJ table)	11

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Terms	Documents
L2 AND calls	5

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Search: L3

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L3	L2 AND calls	5	L3
L2	L1 AND breakpoint and script	6	L2
L1	717/124.ccls.	231	L1

END OF SEARCH HISTORY

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Search Results - Record(s) 1 through 5 of 5 returned.

☐ 1. Document ID: US 6721941 B1

L3: Entry 1 of 5 File: USPT Apr 13, 2004

US-PAT-NO: 6721941
DOCUMENT-IDENTIFIER: US 6721941 B1

TITLE: Collection of timing and coverage data through a debugging interface

DATE-ISSUED: April 13, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Morshed; Farokh	Amherst	NH		
Meagher; Robert	Milford	NH		

US-CL-CURRENT: 717/127; 709/217, 714/38, 717/124, 717/126, 717/128, 717/129, 717/130, 717/131, 719/328

ABSTRACT:

Techniques for gathering execution information about an application, such as a distributed application, are described. Key communication points in cross execution context calls, such as remote procedure calls, are determined and control is transferred to instrumentation routines to insert and extract execution information. Outgoing remote procedure calls are intercepted on a client that inserts call origin information into the request sent to a server system. Messages received by a server are intercepted. The server system extracts the call origin information and additionally inserts other information in a response sent to the client system upon completion of a remote procedure call. In turn, the client system intercepts the response and extracts other performance information. On each client and server system, information is gathered by a reader and forwarded to a local collector. This information may be further forwarded to and correlated by a client collector from one or more remote server collectors in accordance with processes of each distributed application. Various statistics for a distributed application may be determined in addition to per process statistics. These include wire time, code coverage as related to the distributed application, remote procedure call tracing, and performance profiling. A variety of techniques are described to obtain program execution information in connection with an executing application including instrumentation techniques and use of a debugger interface to obtain profiling and other execution information. All of the program execution data may be collected and correlated at one or more particular points using other techniques described to represent coordinated application monitoring.

50 Claims, 82 Drawing figures

Exemplary Claim Number: 1
Number of Drawing Sheets: 77

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. De

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☐ 2. Document ID: US 6701514 B1

L3: Entry 2 of 5 File: USPT Mar 2, 2004

US-PAT-NO: 6701514
DOCUMENT-IDENTIFIER: US 6701514 B1

TITLE: System, method, and article of manufacture for test maintenance in an automated scripting framework

DATE-ISSUED: March 2, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Haswell; John Jeffrey	Herndon	VA		
Young; Robert J.	Charlestown	MA		
Schramm; Kevin	Rose Valley	PA		

US-CL-CURRENT: 717/115; 707/102, 717/124

ABSTRACT:

A system, method and article of manufacture are provided for affording test maintenance in an automated scripting framework. First, a plurality of test scripts are developed. Then, the plurality of test scripts are stored in a centrally located database. A user is then allowed to edit a specific test script located on the centrally located database. Finally, the user edits to the specific test script are propagated to each of the plurality of test scripts.

18 Claims, 82 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 52

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. De

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☐ 3. Document ID: US 5657438 A

L3: Entry 3 of 5 File: USPT Aug 12, 1997

US-PAT-NO: 5657438
DOCUMENT-IDENTIFIER: US 5657438 A

TITLE: Interactive system for developing tests of system under test allowing independent positioning of execution start and stop markers to execute subportion of test script

DATE-ISSUED: August 12, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wygodny; Shlomo	Ramat Hasharon			IL
Zohar; Shahar	Rfar Saba			IL
Azulay; Alex	Herzlia			IL
Slonim; Yochanan	Herzlia			IL
Weinbaum; David	Tel Aviv			IL

US-CL-CURRENT: 714/1; 714/38, 714/45, 717/100, 717/124

ABSTRACT:

A system for developing tests of a System Under Test (SUT) which includes a Central Processing Unit (CPU), a screen and input apparatus. The system for developing tests includes a manipulation apparatus enabling an operator to manipulate, within a test workspace, a sequence of test script statements into a desired script, wherein the test script statements describe operator commands to the SUT and screen capture and verify operations and b) interactive execution apparatus for executing at least a portion of the desired script by providing the at least a portion of the desired script to the SUT thereby to operate the SUT as desired.

19 Claims, 1 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 1

☐ 4. Document ID: US 5590330 A

L3: Entry 4 of 5 File: USPT Dec 31, 1996

US-PAT-NO: 5590330
DOCUMENT-IDENTIFIER: US 5590330 A
**** See image for Certificate of Correction ****

TITLE: Method and system for providing a testing facility in a program development tool

DATE-ISSUED: December 31, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Coskun; Nurcan	Austin	TX		
Tate; Bruce A.	Austin	TX		

US-CL-CURRENT: 717/126; 345/781, 345/810, 714/35, 717/124, 717/131

ABSTRACT:

A method and system for testing a script or section of code within program using a

graphic user interface. The data processing system also includes an object oriented system having a first and second object within it. A script or a section of code is associated with the first object, wherein the script or section of code is associated as a method within the first object. A second object is displayed within the graphic user interface, wherein the second object may be selected by a user. Selection of the second object within the graphic user interface by a user results in a message being sent to the first object triggering execution of the script or section of code. Such a system provides an efficient method and apparatus for testing a script or section of code.

12 Claims, 9 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 8

☐ 5. Document ID: US 5548717 A

L3: Entry 5 of 5 File: USPT Aug 20, 1996

US-PAT-NO: 5548717
DOCUMENT-IDENTIFIER: US 5548717 A

TITLE: Software debugging system and method especially adapted for code debugging within a multi-architecture environment

DATE-ISSUED: August 20, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wooldridge; James A.	Amherst	NH		
Brender; Ronald F.	Hollis	NH		
Grieb, III; Henry N.	Hollis	NH		

US-CL-CURRENT: 717/124; 703/22, 714/37, 717/128, 717/129, 717/134, 717/138

ABSTRACT:

In a computer system that embodies a first hardware (X) architecture and includes a memory system and at least one simulator for a second (Y) architecture and a system for executing and debugging multiple codes having an environment manager that handles cross-domain calls, a debugging system and method are provided for debugging code in each domain as part of said multi-code executing and debugging system in a multi-architecture environment. In response to calls for debugging from either the X domain or the Y domain, commands are generated for controlling operations in both domains. User generated RUN and STEP commands control the machine execution state in the domain where debugging is performed. General support commands and debug operations support commands including EXAMINE, DEPOSIT, SET BREAKPOINT and CANCEL BREAKPOINT commands which are implemented differently for the different domains may also be user generated for controlling debugging.

33 Claims, 13 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 8

Full | Title | Citation | Front | Review | Classification | Date | Reference | References | Attachments | Claims | KWIC | Draw De

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Terms	Documents
L2 AND calls	5

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6/9/100 (Item 7 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

09066658 Supplier Number: 79053272 (THIS IS THE FULLTEXT)
A STEP BY STEP GUIDE TO AUTOMATED SOFTWARE TESTING.
Walker, Tom
Chemical Engineering, v108, n10, p51
Sept, 2001
ISSN: 0009-2460
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Refereed; Trade
Word Count: 3045
TEXT:
Software systems are more complex than ever, making automated software ***testing a necessity.***
Use this guide to evaluate the best available solutions
Companies within the chemical process industries industries are continuously implementing new technological solutions aimed at increasing productivity, reducing costs and facilitating interaction between customers ***and suppliers. Sooner or later, this complex software must be tested to*** ensure that websites and the systems that support them, such as SAP's ***(Walldorf, Germany; sap.com) enterprise resource planning (ERP) software,*** run properly when normal business transactions are carried out by ***customers. While it may be impossible to test every conceivable transaction***

that a customer performs, it is key to emulate as many scenarios as possible to ensure that software glitches do not impede the customer's ***goal. Such objectives make the automated testing of software a necessity*** rather than a luxury, especially for firms that conduct business over the ***Internet.***

One of the most frequent automated tests performed on software is ***the load test. This test ensures that systems can handle hundreds, if not*** ***thousands, of users at one time. This article provides an overview of the*** automated testing process, with special emphasis on the specification, scope, development and implementation of automated load tests (box, ***"Launching A Successful SAP Software Upgrade at Eastman Chemical Co.").***

Manual versus automated software testing
*** In the past, software testing was done manually. The manual process*** involves the simulation of various scenarios by physically entering in all ***of the steps involved in those scenarios. For instance, when testing the*** creation of a customer sale order in SAP, individuals would create master ***data sets representing multiple strategies. These data sets include, but*** ***are not limited to, customer, product and pricing information. However,*** manual tests are costly and time-consuming: Setup can involve many people, engendering high labor costs; furthermore, potential problems with ERP ***software or the Internet portal can drain revenue. Automated testing, while***

it increases the complexity and cost of a test team's effort, provides valuable assistance if its done by individuals who possess the proper skill ***sets.***
*** Automated testing requires the creation of test scripts. A script is***

a code that is written to simulate the actual steps involved in a business ***process. Once the code is written, it is available to those who are*** responsible for executing the scripts in a computer system that simulates ***actual production. Automated testing tools facilitate test design and*** implementation and the measurement of an application's ability to handle heavy loads; are used to evaluate the quality of a test by measuring the code coverage provided by a set of test procedures, or by providing the

metrics needed to evaluate test development; and allow information-technology (IT) personnel to do in minutes what would take hours to do manually, such as:

* Testing real-world conditions and hardware environments
* Load testing, to find out the maximum number of users that applications, databases and servers can handle
* Peak-load testing, to calculate the number of users that systems can process over a specified time period under peak-usage conditions
* Benchmark testing to determine performances of applications, databases and servers under given conditions

Creating virtual user scripts

Test specification is a process during which the team decides what ***tests will be performed and what their scope and objectives will be. This*** ***is done before any tests, manual or automated, are developed. The process*** starts with the generation of as many test ideas as possible, with as diverse an approach as possible

*** 1) Start by listing the most obvious test requirements. These*** requirements are not exact statements of input and expected output; rather, they are ideas of what should be tested, such as, "What is this feature supposed to do? How would I know if it did that?" Sometimes the answers come from written specifications, and other times, from interviewing the ***developers.***

*** 2) Determine the values that define the domain of the input. Usually***

these include a sample average, values at the boundary conditions, values ***beyond the boundary conditions, illegal inputs and error conditions.***

3) Consider which tests, often referred to as "test types," are needed to solve your different software problems:

* Load testing, also called performance testing, is applied to understand the scalability of a website or application, or to benchmark the performance in an environment of third party products, such as servers
* Functional testing is used to determine if an application or website conforms to its specifications and correctly performs all its ***required functions. This entails a series of tests that conduct a*** feature-by-feature validation of behavior using a wide range of normal and erroneous input data
* Portability testing ensures compatibility of an application or website with different browsers, operating systems and hardware platforms
* Regression testing allows a consistent, repeatable validation of ***each new release of a product or website. Such testing ensures reported*** product defects have been corrected for each new release and that no new quality problems were introduced in the maintenance process

4) Review each test type and consider whether it is applicable to ***the problem that you need to solve. Try to generate as many test*** ***requirements as you can.***

*** 5) Convert test ideas into actual test cases. For each test*** ***requirement, consider how to force the conditions. What are the inputs and*** outputs? Are special input files needed? In what kind of configuration should the test be run? How will the tester be able to tell whether the test has passed or failed? This precise description is usually referred to as a test specification, testcase specification, or simply a test ***case.***

*** 6) Create test scripts. Test cases are grouped into scripts*** ***according to the business process that the user wants to simulate. The*** number of scripts needed is determined by the complexity of the website and the application being tested (such as taking a sales order over the ***Internet).***

*** 7) Run test scripts. By using runtime settings, the scripts can be*** ***defined to run the application in the same manner that a client would.*** Because these scripts emulate real users, they are referred to as virtual ***scripts. Runtime settings can be configured to account for whether the user***

is a novice or expert, what type of connection is being used (such as a ***modem, LAN or WAN) and how quickly the system will respond.***

Preparing for heavy loads

Websites integrate hardware, software and networking components from different vendors in order to facilitate e-commerce, site browsing, ***downloads and other Internet-based activities. It is virtually impossible*** to predict how a system will behave under a given load, yet, an increasing portion of company business and visibility is dependent on the World Wide ***Web. For this reason, load tests are of critical importance. Performing a*** load test in which the volume and characteristics of the anticipated traffic are simulated as realistically as possible is a reliable way to ***gain insight into a system's scalability. To do this, one must study*** previous load patterns and design test scenarios that closely resemble ***them.***

The basic steps for designing highly realistic and accurate load tests are: understanding the nature of the load; estimating target load levels, peak load levels, the rate at which users might "ramp up" to the peak load and how long this peak will last; predicting how quickly the overall traffic to a website will grow; and documenting the design of the load test by establishing the test objective, describing both the script ***and scenario, and developing the pass-or-fail criteria. For instance, the*** load test may be considered a success if the website handles a target load ***of 12,000 sessions/h while maintaining a certain page-response time.*** *** System analysis is critical in determining the nature of the load.*** The goal is to identify whether a system will scale and perform to ***expectations (i.e., handle a given load). A thorough evaluation of the*** system's needs and requirements is conducted to provide a realistic test ***environment. This involves not only testing how a product works, but also*** ***how it interacts with other software elements that may impact its behavior.***

The analysis uncovers performance bottlenecks in multilayered software ***environments. Automation ensures that the same test will be run each time*** ***there are changes to the system. Running the same test not only ensures the***

test's stability, but eliminates the need for someone to run the same ***manual test every time there is a change in the SAP software.***

In addition, key performance goals and objectives are identified, such as: What are the number of concurrent connections and hits per second to expect on the website? What specific ERP processes are to be tested? Will the test simulate a transactional process, such as a customer placing an order, or non-transactional process, such as reviewing product literature?

To estimate overall traffic growth, one may take the current weekly traffic (let's say, 100,000 sessions per week) and ask the appropriate people (for example, the vice-president of sales and marketing) what they anticipate in terms of month-to-month growth (perhaps the the company ***anticipates 20%). A new-product launch two months from now is expected to*** draw an additional 200,000 visitors to the website during the week of the ***launch. Alas, you estimate that the website must be able to handle a volume***

of approximately 350,000 visitors/wk, during the week of the launch (144,000 by applying the 20% month-to-month growth for two months, and an ***additional 200,000 from the new-product launch). It is crucial to consider*** that the Web services and the ERP system that processes orders will be ***equally impacted.***

Creating a load-test scenario and running it

The load-test scenario contains information about the virtual users ***and the machine on which the process is being run. In order for the test to***

be successful, virtual users must be assigned to certain business transactions, such as taking a sales order or viewing shipment status ***online. IT personnel specify the number of virtual persons who will be***

conducting these business processes. The load generators on which the
virtual users will run are also selected. Load machines tan be added to the

client side of the system architecture, to accommodate additional virtual
users.
*** At this stage, the test is ready to run. Every component of the***
system requires monitoring: the clients, the network, the Web server, the
application server, the database and all the server hardware. Realtime
monitoring allows the tester to observe every tier, server and component of the software, as well as the application's performance at any time during
the test, thereby facilitating early detection of bottlenecks.
The analysis yields a series of graphs and reports that summarize
the test results. For example, Figure 1 (above) uses generic data to
display standard performance under a load. The graph reflects the total
number of virtual users against the response time. This information can be
used to determine the maximum number of concurrent users when response
times become unacceptable. In Figure 1 (p. 58), the response time increases

dramatically after 8,000 users are recorded.
(GRAPH OMITTED)
Figure 2 shows the total number of transactions that passed and
failed for different scenarios. This graph enables the tester to isolate
bottlenecks and determine the changes needed to improve system performance.

For instance, in Figure 2, the second business transaction has a higher
number of failures than the the other trials. After corrective actions are
taken, the IT worker may run the load-test scenarios again to verify the
adjustments.
(GRAPH OMITTED)
*** To many people, the benefits of automated load testing, are obvious.***

These tests are completed more quickly, yield more-consistent results (thus
improving accuracy) and can be run over and over again with less overhead.
The costs for automated testing of software include those for the purchase, development and maintenance of testing tools (such as software, hardware and servers) and the personnel required to support test automation over the
long term.
However, automated testing is not necessarily easier than manual
testing. It requires a great deal of intuitive and analytical thinking as
well as an extensive software-development effort. But once the automated
tests are up and running, initial efforts begin to pay off. Workers can
focus on test results rather than entering data to simulate realistic
business transactions.
*** Edited by Rita L. D'Aquino***

Sites & Software for Automated testing

Applied Testing and	
*** Technology, Inc.	aptest.com***
*** Arch Ltd.	web-space-station.com***
*** Automatated Testing Co.	autotestco.com***
Cleanscape Software	
*** International	cleanscape.net***
*** International Inst. for***	
*** Software Testing	testinginstitute.com***
Mercury Interactive,	
*** Inc.	mercuryinteractive.com***
*** NorTek Solutions, Inc.	nortekit.com***
*** Segue, Inc.	segue.com***
*** Software Testing Stuff, Inc.	testingstuff.com***
*** Tescom USA	e-testing.com***
*** Tevron, LLC	tevron.com***
*** T-Vec, Inc.	t-vet.com***

RELATED ARTICLE: When Seeking Software for Automatic Testing, Ask:

*** Is the software compatible with current and future ERP releases?**

ERP developers are constantly upgrading their technology. Will the testing
software will keep up-to-date with the changes?

*** Will the software work with multiple platforms? The ability to use the software across a number of platforms provides the greatest cost benefit**

*** What is the cost? Does the cost include installation, training and service? Are there any hidden costs buried in the contract?**

*** How easy is it to use? Will non-IT personnel be able use the software? How long will it take advanced users to program?**

*** Are scripts reusable, or do they need to recreated for each testing function?**

*** Is the testing software certified by the ERP systems developer? Certification by the ERP vendor ensures the compatibility of the testing software with the ERP software**

*** Is the testing software compatible with other systems, such as databases and the computer's operating system?**

*** How frequently is the software upgraded? The more frequently it is upgraded, the more likely it will keep up with changes made by the ERP system vendor**

*** What kind of technical support can be expected? Is the vendor available and reliable? Are technical-support costs included in the cost of the software?**

RELATED ARTICLE: Launching A Successful SAP Software Upgrade at

Eastman Chemical Co.

*** When Eastman Chemical Co. (Kingsport, Tenn.; eastman.com) upgraded***

from SAP R/2 to SAP R/3 4.6b, the company recognized that automated testing

would enable it to upgrade to the new SAP environment more quickly, and

with little or no impact on the users or systems.

Eastman evaluated several automated software-testing tools for the

SAP system. It was important for the tool to be cost-effective, have a
history of success in SAP- and Web-testing applications, and be able to

perform a load stress test on software emulating 3,000 simultaneous users.
A checklist of criteria (box, "When Seeking Software for Automated Testing,

Ask:") was developed.

After a thorough evaluation of the options available, Eastman selected three tools, manufactured by a company in California, for

executing various stages and tasks of application testing. These tasks
included load testing, planning and managing the testing process, and

functional testing. Eastman selected this set of tools because it provided
a turnkey testing environment, and offered more depth and breadth of functionality than competing products, and because of the vendor's

long-standing partnership with SAP AG.

Automated testing saved time for Eastman's electronic-information-services staff, which previously conducted

application testing through a tedious manual process. Furthermore,
Eastman's North American, European, Asian and Latin American regions were able to complete the testing and implementation of the new SAP system with

no disruptions in service to customers or suppliers.

Tests conducted with load-testing software simulated 3,000

concurrent users entering transactions. The firm found that it needed to
adjust data buffers on the application servers to meet such heavy user

demand. Once these changes were made, the tests were rerun. Successful
completion ensured that 3,000 users could run various business processes

without trouble, using SAP 4.6b.

Eastman also continually tests the Web interfaces used by its customers, and utilizes test scripts to validate the changes in SAP

software before these changes are used in production.

Eastman also found the automated testing tools useful for loading

master data into SAP. The software used for functional testing has robotic

features that enhance production processes by eliminating redundant data
entry and the errors associated with it. These same robotic features also
enhance the development and configuration of additional SAP applications.
The testing tools have also been used to produce ad hoc reporting from the
SAP system.

Tom Walker is systems associate of e-Information Services at Eastman
Chemical Co. (100 North Eastman Rd., P.O. Box 511; Kingsport, TN
37662-5075; Phone: 423-229-5207; Fax: 423-229-1188; E-mail:
trwalker@eastman.com or trwalkerl@chartertn.net) and a 31-year veteran of
the organization. He provides business process improvements related to SAP
utilization for Eastman's supply-chain group. The
business-process-improvement efforts are aimed at working with the user community to see that the entire supply chain tasks are managed within SAP
to achieve full value for the process. Walker also serves as Eastman's
workflow administrator and consulting resources manager, and is responsible for training Eastman personnel worldwide in the use of Mercury Interactive tools, which are automated testing tools used as part of Eastman's software
quality-assurance program. He has worked with various SAP products for the
past 10 years, the last three of which he managed several projects related
to SAP R/3 implementation. Walker is on the board for SAP Workflow,
America's SAP Users' Group. He has spoken at a number of SAP seminars, as
well as at the Mercury Interactive User's Group Conference. Walker has a
bachelor's degree in accounting from Stephen F. Austin State Univ. (Tex.).

PUBLISHER NAME: Chemical Week Associates
COMPANY NAMES: *SAP AG
GEOGRAPHIC NAMES: *4EUGE (Germany)
PRODUCT NAMES: *7372410 (Business Applications Software)
INDUSTRY NAMES: CHEM (Chemicals, Plastics and Rubber); ENG (Engineering and Manufacturing)
SIC CODES: 7372 (Prepackaged software)
NAICS CODES: 51121 (Software Publishers)
TICKER SYMBOLS: SAP
SPECIAL FEATURES: COMPANY
? t s6/9/101-150

6/9/101 (Item 8 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

05830474 Supplier Number: 50340208
Testcase for Irish cap on superstores
Super Marketing, p8
Sept 25, 1998
ISSN: 0261-4251
Language: English Record Type: Abstract
Article Type: Article
Document Type: Magazine/Journal; Trade

ABSTRACT:
Irish construction company O'Flynn Construction is to legally challenge a government ruling against its plans to invest IRP 90mn in a new retail
complex in Cork, which would include a 65,000 ft2 supermarket. O'Flynn is

claiming that the new Environment Ministry limit on retail developments to 32,000 ft2 was introduced without any arrangements for those applications
which were already underway. The result will be importasnt for other
companies including Tesco, which had various development plans for the
Quinnsworth chain.

PUBLISHER NAME: Reed Elsevier Business Publishing, Ltd.

COMPANY NAMES: *O'Flynn Construction
EVENT NAMES: *940 (Government regulation (cont))
GEOGRAPHIC NAMES: *4EUIR (Ireland)
PRODUCT NAMES: *6552300 (Shopping Center Developers)
INDUSTRY NAMES: ADV (Advertising, Marketing and Public Relations); BUSN (Any type of business)
NAICS CODES: 23311 (Land Subdivision and Land Development)
SPECIAL FEATURES: COMPANY

6/9/102 (Item 9 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

04226959 Supplier Number: 46184744
Network sales make Hungary an investment testcase
Petroleum Economist, pVI
March, 1996
ISSN: 0306-395X
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

ABSTRACT:
Hungary's December 1995 sale of its gas distribution firms has resulted in ***an unexpectedly hefty profit for the government. The 1995 sale saw foreign*** buyers Ruhrgas/EW, Gaz de France, Italgas/Snam and Bayernwerk/EVN all acquire 50% plus-one-share stakes in regional gas distributors Egaz, Kogaz, ***Degaz, Ddgaz, and Tigaz. Among the firms sold, Tigaz was regarded as the*** top prize because it had control of a larger area than any other gas ***distributor in Hungary. Although the sale of the regional gas firms did not*** come without opposition, it was generally considered a success by foreign investors because it showed the effectiveness of Hungary's government and ***industry reform program. The article also contains a map outlining*** ***Hungary's gas network.***

EVENT NAMES: *970 (Government domestic functions)
GEOGRAPHIC NAMES: *4EXHU (Hungary)
PRODUCT NAMES: *4923200 (Gas Distribution)
INDUSTRY NAMES: INTL (Business, International)
NAICS CODES: 22121 (Natural Gas Distribution)

6/9/103 (Item 10 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

04169979 Supplier Number: 46090596 (THIS IS THE FULLTEXT)
MICROCOSM TAKES OFF WITH MEMS SOFTWARE COMMITMENTS FROM FORD AND TI
PR Newswire, p0124CHW010
Jan 24, 1996
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 825
TEXT:

Former ISS Founder, Mike Jamiolkowski, Launches MEMS Design Automation Company

*** RESEARCH TRIANGLE PARK, N.C., Jan. 24 /PRNewswire/ -- Microcosm*** ***Technologies Inc., has taken a bold step in positioning itself at the*** forefront of the MEMS software industry by unveiling MEMCAD -- its core MIT -- developed microelectromechanical systems software for next generation

MEMS products. The announcement was made by Microcosm cofounder and
president, Michael Jamiolkowski, a former cofounder and vice president of
Integrated Silicon Systems.

Beginning with Ford and TI

Microcosm debuts with key partnership contracts with Ford
Microelectronics and Texas Instruments (NYSE: TXN) as part of the company's
CAD Partnership Program. Ford will use Microcosm software for the design
and analysis of MEMS devices for automotive applications. Microcosm will
develop specific three dimensional modeling capabilities that will allow
Ford to project and perfect the geometries of future automotive devices, as
well as enhance processing and manufacturing analysis. "I am very
encouraged that Microcosm has stepped forward to commercialize MIT's MEMCAD
software. Ford Microelectronics is excited about the possibilities at hand
in a partnership program with Microcosm," said Dr. William Tang, Research
Manager at Ford Microelectronics in Colorado Springs.

Microcosm has also initiated a partnership program with Texas
Instruments. Phil Congdon, TI's Manager of Photonics and Micromachining at
the company's corporate research laboratory in Dallas, said that TI will
use Microcosm's MEMCAD software to model several micromachined devices
including a spatial light modulator, optical switches, sensors, and process
monitoring test structures. Additional planned effort will include the
joint development of process and material characterization structures along
with corresponding software extensions.

The MIT Connection

As a core technology, Microcosm will utilize MEMCAD, a computer- aided
design software suite developed by M.I.T. and licensed by Microcosm. Dr.
Stephen D. Senturia, Weller Professor of Electrical Engineering at MIT and
a visionary in the development of CAD tools for MEMS, stated, "I believe
that the future of the MEMS field depends on the widespread availability of
robust and versatile CAD tools. I am pleased that Microcosm is committed to

providing those tools, and I look forward to a constructive and cooperative
relationship between Microcosm and the MEMCAD program at MIT."

Through extensive development, testcase **performance and customer**
evaluations, MEMCAD is the most advanced and promising MEMS CAD suite
available today. Where in the past, tools for MEMS design have been
fragmented and inefficient, MEMCAD integrates tools in a single seamless
environment. According to Mr. Jamiolkowski, Microcosm's MEMCAD software
offering is expected to become the industry standard for MEM product
design. The first commercial release of Microcosm's MEMCAD software will
take place by March 31. The company plans to make its software suite
available industry-wide to qualified CAD partners during 1996. "The company

plans to expand its own proprietary development effort, license additional
technology and pursue further MIT collaboration," Mr. Jamiolkowski stated.
*** The M.I.T./Microcosm relationship was further solidified with the***
naming of Dr. John Gilbert as Microcosm's Chief Technical Officer. A
cofounder of Microcosm, Dr. Gilbert was previously an M.I.T. research
scientist responsible for the technical management of the MEMCAD system. He

also developed CoSolve-EM, a coupled electro-mechanical solver that is an
integral part of the MEMCAD 2.0 system.

CAD Partnership Program

Microcosm will seek out additional companies to join its CAD
Partnership Program that require advanced software tools to design and
analyze MEMS devices for the next generation of applications. These
applications include medical equipment, automotive products, computer disk
drives, telecommunications, energy management and control systems, and
displays. Mr. Jamiolkowski added that, "Our MEMS software will make a huge

difference to systems designers because costly and time consuming
experiment design cycles can be reduced by computer modeling and analysis.
Microcosm's CAD software allows for alternative multiple design spaces to
be explored without tedious experimentation."

Microcosm's first software products will address 3D visualization of devices from mask and process input, general structural analysis, electromechanical analysis for capacitance-based sensors (accelerometers, gyros, and pressure sensors), and electromechanical analysis for
electrostatic actuation (valves, and force-balanced sensors). The company
will add system level technology by late 1996 for higher level modeling of
MEMS devices with their electronic counterparts.

Company Background

Microcosm Technologies was established in 1995 to develop and market MEMS CAD software with solutions for device design, manufacturing analysis
and system integration. The company provides state-of-the-art software
tools to design mechanical microstructures, microsensors, microactuators, and electronics integrated in the same environment -- on the silicon chip
or in the device package. Microcosm will support MEMS companies that
require better design automation software to accelerate the development of
MEMS devices and systems through manufacture. Microcosm is financed through

private investment.

For further information about Microcosm Technologies, contact Mike
Jamiolkowski at 919-677-9272 in Raleigh, NC.

-0- 1/24/96
*** /CONTACT: Mike Jamiolkowski, President, Microcosm Technologies Inc.,***
919-677-9272, or Chris Burke, BtB Marketing Communications, 919-872-8172/

(TXN)

*** CO: Microcosm Technologies Inc.; MIT; Ford Microelectronics; Texas***
Instruments
ST: North Carolina
IN: CPR
SU: PDT

JB
-- CHW010 --
4740 01/24/96 13:03 EST

PUBLISHER NAME: PR Newswire Association, Inc.
COMPANY NAMES: *Microcosm Technologies
EVENT NAMES: *330 (Product information)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *7372430 (Engineering & Scientific Software)
INDUSTRY NAMES: BUS (Business, General); BUSN (Any type of business)
NAICS CODES: 51121 (Software Publishers)
SPECIAL FEATURES: COMPANY

6/9/104 (Item 11 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

03949276 Supplier Number: 45717428 (THIS IS THE FULLTEXT)
Segue Software's QA Partner 3.0 eases cross-platform GUI testing
PC Week, p77
August 7, 1995
ISSN: 0740-1604

Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Tabloid; General Trade
Word Count: 1359
TEXT:
IS organizations searching for a straightforward cross-platform GUI test tool for their quality-assurance engineers and programmers should evaluate
Segue Software Inc.'s QA Partner 3.0.

This June release gains an easier test script language, called Visual 4Test; automated Testframe creation; and support for multiple application
states.
*** QA Partner competes with Mercury Interactive Corp.'s WinRunner 3.1,***
Software Quality Automation Inc.'s TeamTest 3.0, and Sterling Software
Inc.'s Answer:Testpro 2.5 for Windows (see comparative review, Nov. 28,
1994, Page 89) in the GUI test-tool marketplace. Unlike its competitors,
however, QA Partner supports 25 platforms, including Windows, Macintosh,
and Unix.

Segue shipped late last month its new QA Planner product, which provides such features as planning, management, and reporting of software
testing not included with QA Partner.
*** Version 3.0 of QA Partner ranges in price from $2,995 for PC platforms***

(Windows, Macintosh, NT, OS/2) to $6,995 for Unix platforms. Prices for QA
Planner will range from $1,495 for PC platforms to $2,995 for Unix
platforms. The company is expected to ship a Windows 95 version in late
August.

Test design and creation

A good software test begins with careful planning, but it must be
flexible enough to run with multiple products, such as Microsoft Corp.'s
Visual Basic and Powersoft Corp.'s PowerBuilder. Though QA Partner 3.0
doesn't include any planning features, the interface used to record and
customize scripts is one of the best we've seen.

Like such competing products as TeamTest, QA Partner automatically creates test scripts when the product records a user's interaction with the
application undergoing testing.

For example, after clicking on QA Partner's record button and selecting File/Open from the main menu of a text editor application, the
recorder automatically generated the command (TextEditor.File.Open.Pick)
into the 4Test Script editor.

We were able to easily customize QA Partner's interface and some of
its functions to meet our needs. For example, we changed the 4Test editor's

color scheme for displaying keywords and other strings by selecting new
colors from the options menu (see screen, above).

Visual 4Test, the product's new outlinelike script editor, shaves testing time by simplifying complex test-script creation into a nonprocedural task that most 4GL developers will have no difficulty
mastering.

QA Partner test developers will be able to locate and modify specific test components faster using Visual 4Test, because they can drill down from a general test area to the specific 4Test code that controls that area of
testing.

For example, we were able to double click on a particular line of code--testcase Test1--in our 4Test editor to display an additional nine lines of code that perform the functionality test on one of the dialog
boxes in our test application.

In addition, the Visual 4Test editor displays keywords, verbs, and commands in different colors, so testers will have an easier time searching
for specific commands in their scripts.

Users will be able to get test planning, management, and report
functions with Segue's upcoming companion product, QA Planner. However,
SQA's TeamTest includes these features in one package for $2,495.

Test execution

Although test creation is the most important aspect of testing, the playback,
verification, and debugging of those scripts is also essential to a
successful test. QA Partner offers great playback features as well as solid

verification and debugging capabilities.

We were able to test multiple tasks, which QA Partner calls TestCases, and review the results via the easy-to-use Visual 4Test (see screen, Page
77), which displayed our script. This editor made viewing test results easier than using Mercury Interactive's WinRunner or Sterling Software's
Answer:Testpro.

Like Software Quality Automation's TeamTest, QA Partner automatically compensated for time delays and unplanned events that can occur during
testing. For example, we changed our test script to search for a word we
knew did not exist in our editor application. When QA Partner encountered the unplanned dialog box that appeared as a result of the error, Version
3.0 automatically closed the dialog to resume the test and then reported
the error in the test results.

To make errors easier to spot when the tester analyzes the test
results, QA Partner highlights the errors in red. By simply double- clicking on the red error text, the tester receives text explaining the
exact nature of the problem.

Reports, analysis, and problem tracking

Like Mercury Interactive, Segue opts to separate some testing features, such as reporting, from the main product by offering them in a
companion product. This makes SQA's TeamTest the product of choice for
those customers seeking a single integrated test product.

Although QA Partner does have some reporting capabilities, they are
spartan. For example, we couldn't customize our reports. In addition,
Version 3.0 provides no charting features.

Neither QA Partner nor QA Planner provides defect logging or defect
workflow tracking features.

Ease of installation and learning

Because QA Partner is straightforward and easy to use, developers and quality-assurance testers should not have any problems learning how to use
this product. However, if they find that they must use the tutorial that is

included with Version 3.0, they will find many distracting typos and other
errors.

For example, after beginning QA Partner's text-editor examples in the tutorial, we noticed that the sample screens depicted a test script that
should have been at the end of the tutorial.

In addition to the tutorial problems, QA Partner uses Electronic Book
Technologies Inc.'s DynaText instead of Windows' standard help screens. Because of this, it took us longer to find the desired information in QA
Partner than it did with other products.
*** We used Segue Software Inc.'s QA Partner 3.0 to create test scripts***
for several applications, including a text editor and Microsoft Corp.'s
Access database applications. We designed our tests to incorporate all aspects of client/server applications testing, including designing and creating the test, playing back the test, logging defects, and analyzing
and reporting the test results. We modified certain aspects of our applications, such as positioning form objects, and reran the same test to
perform regress ion analysis and error checking.
*** We tested QA Partner on a 66MHz 486-based Dell Computer Corp.*** Dimension XPS 466V workstation with 16M bytes of RAM and a 512M- byte hard
disk, running under Windows 3.1 and MS-DOS 6.2.

TEST-AUTOMATION TOOLS

*** rtner 3.0***

*** WinRunner 3.1***

*** Reviewed Nov. 28, 1994***

*** TeamTest 3.0***

*** Reviewed Nov. 28, 1994***

*** Answer:Testpro 2.5 for Windows***

*** Reviewed Nov. 28, 1994***

*** SEGUE SOFTWARE INC.***

*** MERCURY INTERACTIVE CORP.***

*** SOFTWARE QUALITY AUTOMATION INC.***

*** STERLING SOFTWARE INC.***

PROS

Visual 4Test language very easy to use; excellent record and playback ***features; supports 25 platforms.***

Powerful script language; can view all object attributes for Visual ***Basic applications.***

Excellent object-based testing using Visual Basic as the script language; wide array of options makes test playback easy; test results can be graphically displayed in reports and charts; built-in test planning and ***defect tracking simplify overall testing cycle.***

Tests both Windows and host-based applications with built-in terminal ***emulation.***

CONS

Planning and reporting features available only in soon-to-be- released ***QA Planner; no problem-tracking capabilities.***

*** No reporting functions.***

Test-planning process isn't integrated tightly enough with test ***development.***

Most expensive product tested; difficult to use; no reports or report ***writer to format test results.***

RECOMMENDATIONS

QA Partner is a great tool for organizations testing applications for multiple platforms, and the Visual 4Test script language reduces the time ***required to record and play back tests.***

Although WinRunner's powerful script language can be used to control its testing features, TeamTest and QA Partner are easier to use without ***sacrificing power in their script languages.***

TeamTest is an excellent testing environment for developers and testers of Windows-based client/server applications, particularly those ***created using Visual Basic. It is the only product tested that attempted to***

cover the entire testing cycle, from planning to analysis of defects.

Answer:Testpro offered the least features for the most money of the ***products PC Week Labs looked at. This product would be suited only for*** **Windows applications that access host data while using one of the supported** ***terminal emulators.***

PUBLISHER NAME: Ziff-Davis Publishing Company

COMPANY NAMES: *Segue Software Inc. (Santa Monica, California)

EVENT NAMES: *330 (Product information)

GEOGRAPHIC NAMES: *1USA (United States)

PRODUCT NAMES: *7372514 (Debugging & Testing Software)

INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office

Automation)
NAICS CODES: 51121 (Software Publishers)
SPECIAL FEATURES: COMPANY

6/9/105 (Item 12 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

03315039 Supplier Number: 44581529 (THIS IS THE FULLTEXT)
TESTING TOOLS ON TRIAL FROM OVUM
Software Futures, pN/A
April 8, 1994
ISSN: 0965-6545
Language: English Record Type: Fulltext
Document Type: Newsletter; Refereed; Trade
Word Count: 1383
TEXT:
Until we learn to make software testing sexier, it will remain neglected.
Gary Flood reports on a new survey which is trying to do just that

It seems axiomatic that for every new Ovum product report published,
some vendors will mutter darkly to Software Futures that their products
either weren't included or got too rough a treatment. So let's save
everyone time by saying upfront that only 26 testing products get a
full-fledged review.

The report* was finished last November by Ovum associate Stephen
Norman, a specialist in the practical and organisational issues surrounding
CAST (Computer Aided Software Testing). It is split into sections covering
the rise of automated testing and so- called dynamic CAST; why testing is a
1990s hot topic; a CAST taxonomy (outlining the two basic distinctions of
CAST, fault finding and support tools); an anatomy of tools, describing
dynamic tools (test driving, capture, comparative and report functions) and
coverage analysers; and an overview of the state of the art in
character-based functional testing and GUI based functional testing is
offered. Performance and load testing are also covered, as are coverage
analysers. Finally, issues like client/server, GUI, links to CASE and
future horizon stuff are covered. And only then the tools!

The full list also includes: Automator QA for Windows/with Navigator
(Direct Technology), AutoTester (Software Recording Corporation),
DTM-VTxx/X Windows (DEC), Evaluator (Elverex), Hiperstation (Peregrine
Systems), LDRA Testbed, The Instrumentation Tool (McCabe & Associates),
Microsoft's MS Test, preVue-X (Performance Awareness), SQA Teamtest
(Software Quality Automation), STW/COV and STW/REG (Software Research),
TestRunner, XRunner and WinRunner (Mercury Interactive), TPNS and WITT
(IBM), Traps and Verify (Computer Associates), Valid/X (Datamat), and V-
Test (Performance Software). These tools run a range of environments
including IBM mainframe, AS/400, Unix/VMS (character based and X Windows),
MS Windows and OS/2 PM, PCs and remote host applications and other
environments.

Tools are presented with a scoring system (1 to 10) on five criteria:
functional testing, performance and stress, advanced features, productivity
and value for money.
*** The choice of tools reflects the rapid rate of change in the field. "A***

product which was state of the art in 1992 may be obsolete today, while a
new release of a previously outdated tool may instantly place it back at
the forefront," writes Norman. "Price/performance ratios of tools in this
sector vary by a factor in excess of 20; some of the most expensive have
the least functionality." Just as important, he adds, is that a tool with a

steep learning curve is a dodo, since testing only occurs occasionally, and
you have to be able to pick up what you need to know very quickly indeed.

Each of the tools also offers functional testing (single or multi-user),
performance analysis (including load monitoring) and coverage analysis.
(The report does not cover testing areas like static analysers and test
harnessing). An additional factor was that all are widely available, have
some track record, and are judged "market leaders." Only two (SQA TeamTest
and ATF) are not well represented and supported in Europe.

Overall Norman feels there is a growing strength in this immature
market. He attributes this interest as a reflection of a move toward better

cost control and process improvement in software development in general;
since up until now so much testing has been a manual effort, it's an area
calling out for automation. This also feeds into better developer morale.
The new tools mean development staff "can push the button, and leave the
system to test itself automatically," says Norman. He also claims to have
seen legacy systems tested off-line for as long as a week at a time with no
need for human intervention. "In the long term, CAST tools will almost
eliminate the need for manual regression testing," he predicts.
*** Now down to brass tacks. What are the specific recommendations,***
according to Ovum, of the tools reviewed in this report? In terms of
cross-platform functional testing, if you have to perform single user
function testing of software under both Unix/X Windows and MS Windows, and
in particular if you need to test ported applications, Norman plumps for
the WinRunner/XRunner combination from Mercury. This product set scores
highly on functional testing and productivity, though low on performance
and stress, and it does not provide object level verification. Get details
from its European distributor in France, Mercury Interactive France, on +33
1 34657240.

For those entering the challenging world of GUIs client/server and so
forth, for single user function testing under MS Windows, "you are spoiled
for choice: WinRunner is the benchmark. It is also the most expensive,"
comments Norman (entry level single- user price is $10,000, with five users
at $25,000). Automator QA for Windows from Direct Technology has the most
powerful and easy to use testcase generation, log file management and
reporting facilities, but no Unix version. "This is a good product to look
at if your testers are not programmers," he adds. Other minus points are
that it is very new (he in fact saw a beta version), has no networking
option and it's all menu driven, though overall it is a powerful, easy to
use MS Windows testing tool costing (single user) $6,120; contact Direct on
(081) 847 1666.

Then there is a spectrum of choices; at the low end, MS Test
(Microsoft) and QA Partner (Seque Software, 0101 617 969 3771), which both
have a "very basic attitude to developing testcases, log files and
reporting in general." On the other hand, "both are very rich in terms of
what can be done in the hands of a programmer."

ATF from Softbridge sits between these products and Automator QA for
Windows. It has a rich programming language, reasonable reporting but
limited object level test case development. "The main reason for buying
this product is that it is the only (one) capable of load testing and
multi-user function testing over a PC network. If you have a client/server
application to test, you should look very seriously at ATF because today
the alternative is manual testing," says the report. Norman recommends a
departmental investment of upwards of $15,000 to get the most out of it;
you'll have to go to the US HQ after a European office was shut in 1990, so
call 0101 617 576 2257.

On the mainframe front, Ovum recommends PC front end software tools
over host ones, and depending on requirements Compuware's Verify (0582
477555) and Hiperstation (Peregrine Systems, 071 589 4567) seem worth
checking out - the former has a useful File Extension feature and the
latter is "an advanced dynamic tool with scripting language, multi-terminal
recording in VTAM and a sophisticated and easy to use comparator. On the
AS/400 there are no native testing tools; use either WITT from IBM,
Automator QA (Direct) and AutoTester (Software Recording Corporation; in

Europe contact ECsoft Groupe services, +33 1 72411341). Functional testing
under OS/2 comes down to WITT, an exceptionally interactive and easy to use
tool whose main drawback for some people may be the lack of support for
testing of MS Windows. An entry level single copy will cost you $2,520.
Unix/VMS users should evaluate V-Test from Performance Software (0753
516500), which earnt brownie points for multi -terminal interactive testing
and support for Unix testing over Telnet or TCP/IP, but which offers no GUI
support at present. In the X Windows camp, for single session functional
testing go for XRunner - but if you have C hackers, willing to set up and
maintain test suites, look at QA Partner (especially since the entry level
costs are lower). For load testing of multi session functional and load
testing, Norman likes preVue-X (distributed in Europe by Magic Computer
Services, 0727 822288), since it provides "respectable and easy-to-use
functionality at a very reasonable price."
*** Anyone trying to improve their software quality story (see p.10) but***
who isn't working on tightening up on testing - an area now beginning to be
populated with good tools - needs their heads examined. You'll save money
and make your programmers' lives better; and it's not often in this life
that you can do both with one phone call, now is it?
* Software Testing Tools, Dr Stepehen Norman, Ovum Ltd, (071) 255
2670. #725.

PUBLISHER NAME: ComputerWire, Inc.
EVENT NAMES: *310 (Science & research)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *7372000 (Computer Software)
INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office
Automation); INTL (Business, International)
NAICS CODES: 51121 (Software Publishers)
SPECIAL FEATURES: LOB

6/9/106 (Item 13 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

03109564 Supplier Number: 44238922 (THIS IS THE FULLTEXT)
Responsible Care: Canada puts third-party 'audits' on the table
Chemical Week, p10
Nov 17, 1993
ISSN: 0009-272X
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 255
TEXT:
With its second test of a proposed compliance verification system completed
just two weeks ago, the Canadian Chemical Producers' Association (CCPA) is
considering this week whether to require the program as part of Responsible
Care. 'I think we should go ahead with it,' says CCPA Responsible Care
director Brian Wastle.
Starting early next year, CCPA could require an 'audit' at member
companies, though one complication may be the expense. Wastle estimates it
will cost $7,000-$15,000 for each company.
That 'should be affordable,' even for a small company, says Vern
Wilson, v.p./operations at Canada Colors and Chemicals (CCC; Don Mills,
ON). '(The verification) process is absolutely essential for the
credibility of Responsible Care.' In addition, says Wilson, a
testcase audit of CCC 'gave feedback to our people' to let them know
how they compare with other companies.
Four verifiers, including two industry volunteers, a professional
auditor, and an environmentalist, studied CCC and Imperial Oil's (Toronto)

agricultural chemicals groups for a week, which included three to four days
of speaking with people at each company. Working from the CEO down, the
team verified that management systems ensure Responsible Care requirements
are met.
Wastle says he is surprised the team was able to examine 20% of the
151 items in depth, quickly checking the others. But, Wastle says, 'we may
have to do a better job of defining the state we expect them to be at.'
*** The U.S. Chemical Manufacturers Association says it is collecting***
information for a similar program.
ELISABETH KIRSCHNER

PUBLISHER NAME: Chemical Week Associates
EVENT NAMES: *420 (Pollutants produced & recycled)
GEOGRAPHIC NAMES: *1CANA (Canada)
PRODUCT NAMES: *2800000 (Chemicals & Allied Products)
INDUSTRY NAMES: BUSN (Any type of business); CHEM (Chemicals, Plastics and Rubber)
NAICS CODES: 325 (Chemical Manufacturing)
SPECIAL FEATURES: INDUSTRY

6/9/107 (Item 14 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01734731 Supplier Number: 42168974 (THIS IS THE FULLTEXT)
CAE Software: Cadre
Electronic News (1991), p18
June 24, 1991
ISSN: 1061-9577
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 77
TEXT:
Cadre Technologies Inc., Providence, R.I., has introduced Teamwork/
TestCase, a front-end computer-aided software engineering tool for
automating software test case generation. It is based on "T," a
requirements test case tool developed by Programming Environments Inc.,
Tinton Falls, N.J. Teamwork/ TestCase *** carries a base price of
$9,995.***
It will be available in August on the Sun Microsystems Sparcstation and in the fourth quarter on the IBM RISC System/6000, the Sun-3 and
Hewlett-Packard workstations.

PUBLISHER NAME: Cahners Publishing Company
COMPANY NAMES: *Cadre Technologies Inc.
EVENT NAMES: *330 (Product information)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *7372430 (Engineering & Scientific Software)
INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office Automation); ELEC (Electronics)
NAICS CODES: 51121 (Software Publishers)
SPECIAL FEATURES: COMPANY

6/9/108 (Item 15 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01734237 Supplier Number: 42168353 (THIS IS THE FULLTEXT)

Cadre tool automates testing of software
Computer Reseller News, p82
June 24, 1991
ISSN: 0893-8377
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 391
TEXT:

BY JUNE GROSS: Providence, R.I.
*** Cadre Technologies Inc., based here, has introduced Teamwork/***
****** TestCase ***, a tool for automating testing of software development.***

The new product, with a list price starting at $9,995, is tightly integrated with Cadre's Teamwork line of computer-aided software
engineering tools, the company said.
*** "Teamwork/*** TestCase *** ... automatically generates multiple***
top-quality test cases, enabling developers to demonstrate that what they've implemented is what they defined," said David Banks, Cadre
president.

Teamwork/TestCase **is designed to test at all stages of software**
development. Test cases generated are traceable, employ boundary-value
analysis, equivalence class partitioning, cause-effect graphing and error
guessing. Tests can be maintained and re-used as needed. New tests can be
regenerated when requirements change.

The product is based on "T," a test-case generation tool developed by
Programming Environments Inc., of Tinton Falls, N.J. The new product
automates the choosing of a test set, aiming to select the smallest set
possible to find the most errors.
*** "Ad hoc test cases cannot ensure thorough product testing. The goal of***

test-case generation is to define the minimum set of non-redundant test
cases that will detect the most common defects. Teamwork/ TestCase ******

does this automatically," said Cadre product manager Bill Sundermeier.

Added David Dayton, Cadre's executive vice president of marketing,
"errors happen near limits. What is not often tested is invalid inputs,
those just outside what is expected as input."

A major player in software development, Cadre's yearly sales of CASE tools amount to $40 million on such diverse platforms as UNIX, VMS and
OS/2, according to Dayton.

Cadre expects test tools to become a $10 million to $20-million
business over the next two years. "We are counting on it as a major growth
opportunity for us," Dayton said.

Although Cadre sells through a small handful of VARs, the Teamwork
line is largely sold through workstation distributors and direct. While a
few Sun VARs have recently expressed interest in carrying the product, Dayton does not anticipate a widespread change in the distribution scheme until UNIX is widely accepted for non-technical applications and
applications are widely distributed on the platform.
*** In August, Cadre plans to ship the product on the Sun SPARCstation. In***

the fourth quarter, Teamwork/TestCase **is scheduled to ship on Hewlett-Packard HP-UX and Domain, IBM RS/6000 and OS/2, DECstation and**
VAXstation platforms, the company said.
***
PUBLISHER NAME: CMP Publications, Inc.
COMPANY NAMES: *Cadre Technologies Inc.
EVENT NAMES: *330 (Product information)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *7372430 (Engineering & Scientific Software)
INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office Automation)

NAICS CODES: 51121 (Software Publishers)
SPECIAL FEATURES: COMPANY

6/9/109 (Item 16 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
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01726627 Supplier Number: 42156997
Cadre Adds Testing Tool To CASE Line
PC Week, p61
June 17, 1991
ISSN: 0740-1604
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Tabloid; General Trade

ABSTRACT:
Cadre Technologies has unveiled the Teamwork/TestCase tool that quickens the production of software testing routines by up to 60% through ***integration with the company's Teamwork CASE product line. The*** test-generation tool automates the process of writing custom testing ***routines to eliminate bugs in software. The product is based on the T*** test-case-generation system developed by Programming Environments (PEI) ***(Tinton Falls, NJ). The 2 companies have signed a joint development and*** marketing agreement that permits Cadre to sell T with other Teamwork CASE ***products. Teamwork/*** TestCase *** will be directly sold by Cadre through*** ***its distributor network. *** TestCase *** will be shipped for Sun*** Microsystems' SPARCstations in 8/91 and for Sun-3, IBM RS/6000 and ***Hewlett-Packard HP-UX workstations by end-1991.***

PUBLISHER NAME: Ziff-Davis Publishing Company
COMPANY NAMES: *Cadre Technologies Inc.
EVENT NAMES: *330 (Product information)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *7372430 (Engineering & Scientific Software)
INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office Automation)
NAICS CODES: 51121 (Software Publishers)
SPECIAL FEATURES: COMPANY

6/9/110 (Item 17 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
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01726216 Supplier Number: 42156519 (THIS IS THE FULLTEXT)
RACE FOR CASE STANDARDS
InformationWeek, p54
June 17, 1991
ISSN: 8750-6874
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Tabloid; General Trade
Word Count: 501
TEXT:
Members of the Institute of Electrical and Electronics Engineers (IEEE) will soon vote on critical interface standards for computer-aided software ***engineering technology. While standards groups struggle with definitions*** for the burgeoning CASE market, vendors continue to fix and fit their own ***solutions in hopes of winning market share.***
The IEEE is attempting to accelerate the standards process for CASE ***and overtake vendors attempting to establish de facto standards. More than***

100 members of the IEEE will vote on the technology that makes up the P-1175 standard for interconnections between CASE tools, including IBM's ***AD/Cycle and repository.***

Larry Bannister, software test engineering group leader with United ***Parcel Service subsidiary Tomorrow Inc. of Salem, Ore., is building a*** system that will let UPS managers communicate with their entire domestic ***road fleet from a central hub. "The 1175 standard can give us the*** combination of requirements and design for push-button control of a fully ***automated test suite," he says.***

The reference standard from the IEEE, which would determine proper semantics for open CASE interfaces, might be available by the end of the ***year, says Bob Petersen, chairman of the IEEE's 1175 committee.***

Despite the effort, some analysts say there is no way of stopping de ***facto standards. "I wish it were different, but the real progress will be*** made around IBM and AD/Cycle," says Vaughn Merlyn, partner at the center ***for IT with Ernst & Young in Boston. "In the meantime the consolidation of*** ***focused CASE product segments makes sense."***

In addition to the interconnection standard, the whole application development life cycle needs to be addressed, including early testing of ***those applications. "Too many CASE tools focus on the design phase," says*** Darl Patrick, senior member of the technical staff for Sandia National ***Laboratories in Albuquerque, N.M. His staff evaluates hardware and software***

for the Department of Energy for items delivered to the Department of ***Defense. "If you test at all," he points out, "you test what is built as*** ***opposed to what's required."***

*** To address that need, last week Cadre Technologies Inc. of Providence,***

R.I., unveiled a proprietary product merging its design and analysis CASE tools with a requirements test-case generation tool called "T," from ***Programming Environments Inc. (PEI) in Trenton Falls, N.J. Teamwork/*** TestCase, a joint development effort of Cadre and PEI, will ship in ***August for the Sun Microsystems Inc. SparcStation platform for $9,995.*** Releases for other Unix platforms will be in the fourth quarter, according ***to Cadre. The tool is a text-based application that runs on Unix, DOS, and*** ***Digital Equipment Corp. VMS systems.***

"The merger of Cadre graphics with T eliminates the drudgery of programmers having to lay out what to do in order to have requirements ***testing," says Sandia's Patrick. Technicians can set up the requirements*** ***while programmers develop applications. "Budgets are being cut all over so*** there are few large staffs any more," he says, "but we must have the ***physical capability to test programs before the users take them."***

--Martin Garvey

PUBLISHER NAME: CMP Publications, Inc.

EVENT NAMES: *350 (Product standards, safety, & recalls)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *7372490 (Applications Software NEC)
INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office Automation); TELC (Telecommunications)
NAICS CODES: 51121 (Software Publishers)

6/9/111 (Item 18 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01601964 Supplier Number: 41972424
Fluke adds Summation, Inc.
Service News, p39
April, 1991

ISSN: 1046-1965
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

ABSTRACT:
Summation (Kirkland, WA), a manufacturer of software test systems, has been
acquired by John Fluke Mfg. Fluke will keep important Summation personnel
in design, manufacturing, applications, and sales, eventually moving those
employees to its Everett facilities. Summation makes *** TestCase ***
software, SigmaSeries Functional ATE workstations, and the Spectrum
functional and diagnostic software. Fluke's board test operations strategy
is concentrated on the distributed test concept whereby small but highly
functional ATE workstations can be situated near to or within a
manufacturing work cell. Fluke states that the combination of its
development resources with Summation technology will produce new
manufacturing test and troubleshooting products in the 1990s.

PUBLISHER NAME: CESN Publications
COMPANY NAMES: *Fluke Corp.; Summation Inc.
EVENT NAMES: *160 (Asset sales & divestitures); 150 (Acquisitions & mergers)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *3825000 (Test & Measuring Equip)
INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office Automation)
NAICS CODES: 334515 (Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals)
TICKER SYMBOLS: FLK
SPECIAL FEATURES: LOB; COMPANY

6/9/112 (Item 19 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01534889 Supplier Number: 41872803 (THIS IS THE FULLTEXT)
John Fluke to Acquire Summation
Electronic News (1991), p20
Feb 18, 1991
ISSN: 1061-9577
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 299
TEXT:
EVERETT, Wash. -- John Fluke Manufacturing Co. Inc. has agreed to purchase
Summation Inc., a supplier of board test equipment workstations and
software located 20 miles away in Kirkland.
Subject to the approval of Summation's shareholders, the acquisition
is expected to close on or about March 1. Fluke plans to move more than
half of Summation's 65 employees to its headquarters here, where Fluke will
take over design, manufacturing, applications and sales of the Summation
product line.
"We would expect to retain better than 50 percent, perhaps as many as
40," the spokesman said. The financial terms of the deal were not
disclosed.
Summation's president and chief executive David Bullis, a co-founder,
is leaving the firm as a result of the pending acquisition.
"They've already got a CEO and I don't think I'm going to be offered
the position," Mr. Bullis quipped last week, adding he will take some time
off before plotting his next career move. "I don't have any plans yet. I've

been at this for quite a long time. I'm not necessarily going to stay in

test."
Another founder, Jim Bloomer, left Fluke to help start Summation in
1984. Mr. Bullis, who replaced Mr. Bloomer as president two years ago when
Mr. Bloomer left the company, and another Summation founder, David A.
Seres, came from Du Pont Co.
Dave Katri, vice president and group manager of Fluke's
Manufacturing/R&D group, will oversee the Summation product line.
Summation makes the SigmaSeries-based test workstations and
****** TestCASE *** software. The company's latest product is the Spectrum line***
of functional test and diagnotics software. In late 1988, Summation
acquired another startup making board test products, Support Technologies
Inc. of Portland, Ore.
Fluke plans to continue marketing and supporting all of these products
and add international sales and marketing through its subsidiaries.

PUBLISHER NAME: Cahners Publishing Company
COMPANY NAMES: *Fluke Corp.; Summation Inc.
EVENT NAMES: *160 (Asset sales & divestitures); 150 (Acquisitions & mergers)
GEOGRAPHIC NAMES: *1USA (United States)
PRODUCT NAMES: *3573000 (Computers & Peripherals); 3825000 (Test & Measuring Equip)
INDUSTRY NAMES: BUSN (Any type of business); CMPT (Computers and Office Automation); ELEC (Electronics)
NAICS CODES: 334111 (Electronic Computer Manufacturing); 334515 (Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals)
TICKER SYMBOLS: FLK
SPECIAL FEATURES: LOB; COMPANY

6/9/113 (Item 20 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01520031 Supplier Number: 41850696 (THIS IS THE FULLTEXT)
FLUKE TO ACQUIRE SUMMATION
News Release, p1
Feb 6, 1991
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 876
TEXT:
February 6, 1991
*** John Fluke Mfg. Co., Inc.***
*** P. O. Box 9090***
Everett, WA 98206-9090
206/347-6100
Fax: 356 5116
Twx: 910 445 2943
Tlx: 185102

Contact: Debby Coyne
Public Relations Administrator
206/356-5671

FLUKE TO ACQUIRE SUMMATION

(EVERETT, WA) In yet another move to expand and strengthen its array
*** of board test offerings, John Fluke Mfg. Co., Inc. announced today***

*** that it has signed a letter of intent to acquire Summation, Inc. of***
*** KirKland, Washington, for an undisclosed price. Completion of the***
*** transaction still requires the approval of Summation's shareholders.***

Summation, founded in 1984 and privately held, has pioneered software capabilities for test systems with its TestCASE
software, SigmaSeries
Functional ATE Workstations, and just this year with its new
*** generation SPECTRUM Functional Test and Diagnostics software. Fluke***
manufactures and markets low cost automated printed circuit board test systems, including the Fluke 9100 series of Digital Test Systems, the Fluke 900 Troubleshooter, and the 9400 series of
*** Manufacturing Defects Analyzers introduced this month.***

Dave Katri, Vice President and Group Manager of Fluke's Manufacturing, MR&D Group, emphasized the strategic value of an
*** acquisition of Summation. "Summation's products and technologies are***
*** an excellent complement to our current offerings," Katri said. "With***
the joining of our product families, Fluke will now address process and functional testing for complex printed circuit boards, including those having multiple microprocessors, mixed-signal technology and
*** even fine-pitch surface mount. We're committed to providing our***
customers with high value for their investment and we're confident that the addition of Summation's products and technology will allow us to more fully address the toughest testing problems our customers
*** encounter." ***

Fluke to Market Existing Products

Fluke will continue to market Summation's SigmaSeries-based ATE workstations and TestCASE
*** software. In addition, Fluke will actively***
*** market and enhance Summation's just-introduced SPECTRUM software.***
SPECTRUM is a fully integrated test software environment for ATE: it supports multiple hardware platforms including GPIB, proprietary hardware environments and the emerging VXI standard for instruments
*** on cards. The SPECTRUM environment features the new expanded fault***
dictionary concept which allows diagnosis of board faults based on
*** multiple test methods. In addition to the traditional driver/sensor***
test results, the fault dictionary transparently integrates results from microprocessor emulation, high-speed nodal measurement and even
*** analog test into the diagnostic database.***

"SPECTRUM is a major asset," noted Katri, "because of its comprehensive diagnostic capability and the flexibility of the
*** Microsoft Windows 3.0 environment. We believe this to be the first***
*** test software system based on Windows 3.0, and we've heard excellent***
*** feedback from customers who have used the product in Beta testing.***
*** This world-class offering made Summation especially attractive to us.***
In the future, you will see additional products from Fluke based on
*** the SPECTRUM environment."***

A Fit with Fluke's Board Test Strategy

Fluke's board test business strategy is focused on providing test solutions based on the concept of distributed test--small but highly functional ATE workstations that can be located close to or within a
*** manufacturing workcell. This strategy contrasts with that employed by***
traditional ATE suppliers who offer large, very expensive,
*** centralized systems. The company believes that distributed test***
systems such as those offered by Fluke and Summation are better aligned with the requirements of electronics manufacturers in the

future, since they are looking to reduce costs while still building
*** high qualiry products.***

The combination of Summation technology with Fluke development
resources will lead to new products in the areas of manufacturing
*** test and troubleshooting in the 1990s. "Our acquisition of***
*** technologies from Computest, Inc. last Fall, the introduction of the***
Fluke 9400 Manufacturing Defects Analyzer in January, and now this
acquisition offer strong evidence of Fluke's commitment to customers
*** with board test problems," Katri said. "Customers will see continuing***
heavy investment in board test product development, support
*** resources, and technologies."***

*** The acquisition is scheduled to close on or about March 1, 1991.***
Fluke will retain key Summation employees in design, manufacturing,
applications and sales, ultimately moving those in their Kirkland
*** headquarters to Fluke's Everett, Washington facilities. Summation's***
*** key U.S. field sales staff will be integrated into appropriate Fluke***
*** field locations, as well. Philips, with whom Fluke has a strategic***
alliance, will market Summation products in Europe, once the
*** transition from Summation's sales representatives is completed. Fluke***
also plans to market Summation's products in the rest of the world
*** through their existing subsidiaries and sales representaflves.***

Said Katri: "We have a fundamental goal in the early stages of this
acquisition to unfailingly meet customer delivery commitments and to
*** fully support Summation's customers. We would like the transition to***
be almost transparent for them; all that they should notice over time
is an increased level of support available to them because of Fluke's
*** expanded support base."***

*** John Fluke Mfg. Co. Inc. is a leading supplier of high quality***
electronic instrumentation and services that improve the productivity
of technical users engaged in research, service, design,
*** manufacturing and calibration. Fluke serves customers who are***
manufacturers and users of electronic and electrical equipment in
defense and aerospace, government agencies, computers and
peripherals, electronic instrumentation, communications, utilities,
*** automotive, and consumer electronics. Founded in 1948 and***
headquartered in Everett, Washington, Fluke employs over 2,100 people
*** worldwide, producing revenues of $233.8 million in its most recent***
*** fiscal year, ended September 28, 1990.***

PUBLISHER NAME: Various
COMPANY NAMES: *Fluke Corp.
EVENT NAMES: *160 (Asset sales & divestitures); 150 (Acquisitions & mergers)
GEOGRAPHIC NAMES: *1USA (United States); 1U9WA (Washington)
PRODUCT NAMES: *3825000 (Test & Measuring Equip)
INDUSTRY NAMES: BUS (Business, General); BUSN (Any type of business)
NAICS CODES: 334515 (Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals)
TICKER SYMBOLS: FLK
SPECIAL FEATURES: LOB; COMPANY

6/9/114 (Item 21 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

01409138 Supplier Number: 41681064 (THIS IS THE FULLTEXT)

Titans Team To Help Build Global Nets

CommunicationsWeek, p1
Nov 19, 1990
ISSN: 0746-8121
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 719

TEXT:

NEW YORK--In a ground-breaking move to help multinational corporations develop their networks, four communications giants last week formed an alliance to coordinate and design international private networks that will ***use public-network facilities.***

AT&T, British Telecom plc, France Telecom and Kokusai Denshin Denwa have agreed to join forces in designing custom networks for voice, data, ***facsimile, video and imaging services.***

Users could reap the significant benefits of one-stop shoping under the plan because it lets customers select one carrier to coordinate the ***design instead of dealing with all four.***

And while in the United States AT&T may have been the first out the ***door with its alliance declaration, the alliance may not be alone for long.***

MCI Communications Corp. is working on a similar arrangement with foreign telecommunications companies, and an announcement could come by year's end, ***a spokesman said last week. MCI chairman William McGowan reportedly is*** ***spearheading MCI's alliance effort in travels abroad.***

The new alliance--drawing an informal "ABFK" moniker from the vendors' names--is targeting customers from the top 1,000 companies with multinational locations, said Barbara Fels, product manager for global ***networking at AT&T. About 70 percent of the world's multinational companies*** are headquartered in one of the four countries in which the members of the ***alliance are based, she said.***

"Any company that has extensive international traffic would be a target for us, and they don't necessarily have to be in all of the four ***countries," Fels said.***

No new products or capabilities were revealed in conjunction with the ***alliance. Yet the companies said new systems and network offerings may*** ***arise to meet particular user needs.***

Another potential outcome of the alliance is the development of new, separate network facilities to connect the four countries said Gabriel ***Sidhom, director of marketing at Paris-based France Telecom. Such a*** ***development would be based on customer demand in those nations.***

'BETA TESTERS'

The ABFK is considering four to six "beta testers," which will be companies that will help the partners determine policies, types of service ***offerings and procedures. At least one *** testcase *** company will be based*** in each country, said Bruce Stanford, London-based British Telecom's vice ***president of correspondent relations.***

The alliance was prompted by the ongoing development of General ***Electric Co.'s international network. GE, based in Fairfield, Conn., signed*** a fiveyear contract with AT&T, France Telecom, and British Telecom in mid-1989 to design and implement a private network extending to 25 ***countries. (Communications Week, June 12, 1989).***

As the three companies grappled with the technological, regulatory and design issues in GE's network, they realized a structured group could help ***with future customers, Fels said.***

"This will be a situation where the carriers would collaborate on ***design and in setting up standards," Fels said. "Today, we don't do that. A*** customer may ask one of the carriers to build a network, but there's no

guarantee it will come together as a seamless network."
Stan Welland, manager of corporate telecommunications at GE, applauded
the alliance's formation. He said GE did not have the staff or the
expertise needed to design an international private network. "In terms of
carriers working on behalf of customers, it is certainly worthwhile," he
said.
Welland said GE has noticed "indirect savings" because of the
carriers' quick pace in getting the network operational. The GE system is
up and running and is being enhanced.
In addition, the carriers purchased equipment needed to operate GE's
network, which saved the company capital investment, Welland said.
OTHERS WILL BE ADDED
Officials from the alliance said the group could grow to include other
foreign telecommunications companies.
Once standards for transnational services and alliance procedures are
in place, users won't have to work out separate arrangements with each
carrier, Fels said. Prior to the GE network design, each carrier looked at
global network designs with "tunnel vision," which led to costly
redundancies, she noted.
By Robin Gareiss
A Plan To Make Global Networking Easier
Some benefits expected from the alliance among AT&T, British Telecom
France Telecom and KDD:
User deals with one carrier, who co-ordinates work with other carriers
Knowledge of regulations and networks in each country
Dedicated private-network facilities and features in each country
served by the alliance
Carriers work together to eliminate redundancies in network design
A single carrier can initiate global reconfiguration

PUBLISHER NAME: CMP Media, Inc.
COMPANY NAMES: *American Tel & Tel; British Telecom Inc.; France Telecom;
*** Kokusai Denshin Denwa Company Ltd.***
EVENT NAMES: *140 (Parent-to-subsidiary activities); 360 (Services information)
GEOGRAPHIC NAMES: *1USA (United States); 4UK (n/a); 4EUFR (France); 9JAPA (Japan); 4EUUK (United Kingdom)
PRODUCT NAMES: *4811300 (International Telephone Service)
INDUSTRY NAMES: BUSN (Any type of business); TELC (Telecommunications)
NAICS CODES: 51331 (Wired Telecommunications Carriers)
SPECIAL FEATURES: COMPANY

6/9/115 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

15505443 SUPPLIER NUMBER: 98163836 (THIS IS THE FULL TEXT)
Axis Systems to Demonstrate How Software and Hardware Engineers Can Speak
*** in Common Terms at DATE; HW/SW Co-Verification for SoC Designs.***
Business Wire, 5092
Feb 28, 2003
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 330 LINE COUNT: 00031

TEXT:
Business Editors/High-Tech Writers
DATE
*** MUNICH, Germany--(BUSINESS WIRE)--Feb. 28, 2003***
Are you a software engineer who has attempted to communicate a hardware issue, but were unable to do so because you could not provide a

verification time or testcase? Would you find it useful to be able to isolate problems in either software or hardware in your embedded ARM designs?

Axis Systems, DATE booth #F22, will unveil the industry's first complete product for hardware and software verification for embedded
vertical markets. Axis' latest product family, XoC, provides a common
communication environment between software and hardware teams. XoC makes it

possible for software designers to verify code functionally, before
silicon, without having to learn hardware verification methodologies. Axis
will be demonstrating XoC, the complete SoC verification solution for ARM processors and our language-neutral capabilities with in-circuit emulation
(Xtreme) on two real customer designs.

XoC will be available for up-close-and-personal experience at a hands-on tutorial with CoWare on Tuesday, March 4 at 10:30 entitled
"Designing and Verifying a SoC for a Wireless Digital Assistant." To
register for DATE and the tutorial, go to the registration form at
http://www.date-conference.com/registration/regconf03b.htm and select H1
under Hands-On Tutorials.

Frank Germer, Director of the Semicustom IC Design Center at Micronas, who will present his experiences with Axis at, "A reusable and synthesizable testbench approach for multimedia and automotive
applications" on Thursday, March 6 in the Exhibition Theatre Hall at 13:20.

In addition, Steve Wang, Cofounder of Axis, will be part of the panel "Different Perspectives on Reconfigurable Computing" on Wednesday, March 5
at 14:30.

Axis verification platforms are based on patented ReConfigurable Computing (RCC) technology, delivering a single system with a unified database for simulation, acceleration, emulation, and hardware/software co-
verification.

If you are interested in private meetings or demos, please contact
Jose Gandlarz at jose@axissystems.com.

INDUSTRY CODES/NAMES: BUS Business, General; BUSN Any type of business
FILE SEGMENT: NW File 649

6/9/116 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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14524550 SUPPLIER NUMBER: 82664311 (THIS IS THE FULL TEXT)
news bulletin.
Electronics Weekly, 20
Nov 7, 2001
ISSN: 0013-5224 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 563 LINE COUNT: 00048

TEXT:

1 Tool suites for FLT-68K processor

Software developer Crossware has developed two suites of tools for
users of the FLT-68K processor training system. The FLT-68K trainer,
produced by Flite Electronics, has been used by students in the UK for many
years. Crossware's tools add source level debugging and source level
simulation. The tools replace the Flite command line interface, bringing
Windows to the system. The standard version of the tool has a relocatable
macro cross-assembler, while the advanced version includes an ANSI C
compiler and libraries.
*** www.flite.co.uk***

*** www.crossware.com***

Real-time trace tool for ARC chip

ARC has introduced a real-time trace tool for its Tangent-A4
processor. This allows debugging of the core at its target operating
frequency without adding significant amounts of hardware or pins, the firm
said. The system extends to multiple processor designs. The tool can trace
instructions, data, timing, external events and interrupts. It runs
independently of the rest of the processor, allowing operation to continue
while the trace is analysed. Various compression techniques allow three
cores to be traced through a four-bit wide interface.

Tensilica Xtensa can be decoder

Configurable processor firm Tensilica has announced software that
turns its Xtensa processor into a Dolby Digital AC-3 decoder. The design
combines extra hardware to accelerate the Dolby algorithms and the software
itself. The firms claim the system provides 113dB dynamic range. A 32-bit
precision floating point datapath runs at 45MHz on the most difficult
****** testcase *** in the Dolby suite - 48kHz sample rate, 640kbit/s data.***
Dolby Digital has up to five channels plus a sixth for low frequency
effects. The application package will cost $90,000 and be available from
January.

SynTest detects PCB wiring faults

SynTest Technologies has unveiled its first test and debug product
aimed at detecting wiring faults on PCBs. TurboDebug-PCB includes software
and hardware to debug circuit boards. The test hardware is placed on a
prototype PCB along with the system ICs. The schematic shows where
connection problems occur. "Next year, we plan to announce follow on
products that will improve board as well as IC and SoC test and debug prior
to full production testing," said Ravi Apte, v-p of marketing at SynTest.
The tool is PC-based, running on Linux operating systems.

Hardware/software video codecs

ImageCom has developed video codecs that are available in both
hardware and software form. The codecs support both H.323 and MPEG4
algorithms giving up to TV quality over Internet protocol and wireless
networks. The hardware version is aimed at systems needing high reliability

and small size, said ImageCom. The Maidenhead firm recently announced its
first products in the wireless and mobile sector.

Microsoft uses CSR protocols

Bluetooth protocols from Cambridge Silicon Radio (CSR) are being
included by Microsoft in the drivers for Windows CE.NET, the latest version

of the embedded operating system. The protocols are the BlueCore serial
protocol (BCSP) and host controller interface transport protocol (HCI). The

BCSP is more advanced than standards such as H4/UART and H3/RS232, said
CSR, adding error checking, re-transmission and flow control for several
logical channels. The protocol comes as a pre-compiled Windows DLL or as C
source code for non-PC applications.

COMPANY NAMES: Cambridge Silicon Radio
INDUSTRY CODES/NAMES: BUSN Any type of business; ELEC Electronics; INTL Business, International
DESCRIPTORS: Computer industry
PRODUCT/INDUSTRY NAMES: 3573000 (Computers & Peripherals)
SIC CODES: 3571 Electronic computers
NAICS CODES: 334111 Electronic Computer Manufacturing
FILE SEGMENT: TI File 148

6/9/117 (Item 3 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

14434188 SUPPLIER NUMBER: 84188929 (THIS IS THE FULL TEXT)

Qualis Announces Advanced Verification Methodology Course for OpenVera; Course for VERA Testbench Tool Users Raises Verification Productivity and *** Speeds Time-To-First-Test.***

Business Wire, 0287
March 26, 2002
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 578 LINE COUNT: 00062

TEXT:

Business Editors/High-Tech Writers

*** LAKE OSWEGO, Ore.--(BUSINESS WIRE)--March 26, 2002***

Qualis(R) Design Corporation, the independent leader in advanced verification methodologies, announces the availability of its new verification methodology course "Expert Verification Strategies using OpenVera" for users of the OpenVera(TM) hardware verification language and ***Synopsys' VERA(R) testbench tool. The new three-day course teaches*** engineers how to create advanced verification models and environments that leverage the powerful aspects of VERA, including constrained-random ***simulation, temporal expressions and functional coverage. The course is the*** latest addition to Qualis' portfolio of advanced verification methodology courseware for hardware verification language and Domain Verification ***Component(TM) users.***

"With the growing importance of hardware verification languages like OpenVera, engineers need access to leading methodology know-how to solve their functional verification challenges," said Janick Bergeron, chief ***technology officer of Qualis. "We've distilled our knowledge gained from*** years of working with industry leaders in verifying the most complex networking, wireless and processor designs into a three-day methodology ***infusion. Both beginner and advanced users of VERA will profit from the*** ***real-world methods and techniques taught in the course."***

Focused verification methodology content

The advanced course covers the crucial aspects of advanced verification methods, including:

-- Developing a verification plan suited for directed random verification

-- Developing a verification environment that leverages directed random methods

-- Using functional coverage to measure verification progress and use as feedback to direct testcase development

-- Modeling data objects from an object-oriented approach

-- Methods of constraining random generation to simplify controllability

-- Designing bus functional models that support a directed random approach

-- Self-checking strategies for protocol-centric applications like datacom

A detailed description of the course content can be found on the ***Qualis website at http://www.qualis.com/syllabi/vera-200.html.***

"With the increasing demand for verification knowledge, it's important that companies like Qualis offer advanced verification methodology training," said James Watts, OpenVera program manager at

Synopsys, Inc. "The growing number of classes supporting OpenVera will
benefit end users by allowing them to leverage the full power of OpenVera
and VERA to simplify and accelerate the creation of complete, interoperable
verification environments."

"Qualis has a reputation of delivering the latest in verification
methodologies through its exceptional training courses," said Bill Knapp,
vice president of development, advanced networking products division at
Vitesse Semiconductor. "This new advanced course for VERA users promises to

raise the productivity of our verification engineers by tapping into the
most powerful constructs of OpenVera and advanced verification techniques."

Pricing and availability

The three-day advanced course "Expert Verification Strategies Using
OpenVera" is available today from Qualis. Public sessions of the course are

available at Qualis training centers in North America and Europe, and
private courses can be taught at the customer's site worldwide. Cost for
the course is $US 2700 per student with quantity discounts available. More
information about Qualis' line of advanced methodology courses can be found
on the Qualis website at http://www.qualis.com/learning.html.

About Qualis Design

Qualis Design is the leading independent verification methodology
company offering a rich selection of productivity enhancing Domain
Verification Components(TM), methodology consulting, and best in class
training services. By leveraging its deep experience in verifying
networking, processor/SoC, and wireless products, Qualis creates
verification product solutions that solve the most challenging functional
verification problems in the world. Users of Qualis' revolutionary
technology and verification methodology know-how build sustainable
competitive advantages that keep them on the edge. Qualis is headquartered
in Lake Oswego, Oregon and has development centers in Ottawa Ontario
Canada, and Grenoble, France. To learn more, visit http://www.qualis.com/.

*** COMPANY NAMES: Qualis Design Corp.***
INDUSTRY CODES/NAMES: BUS Business, General; BUSN Any type of
business
GEOGRAPHIC CODES/NAMES: 1USA United States
FILE SEGMENT: NW File 649

6/9/118 (Item 4 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

14321931 SUPPLIER NUMBER: 83252143 (THIS IS THE FULL TEXT)
Qualis Releases Ethernet Verification Component for Hardware Verification
*** Language OpenVera.***
Business Wire, 0465
Feb 25, 2002
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 859 LINE COUNT: 00094

TEXT:

Business Editors/High-Tech Writers
*** LAKE OSWEGO, Ore.--(BUSINESS WIRE)--Feb. 25, 2002***

Powerful Verification Model Significantly Reduces
Time-to-First-Test by Merging Protocol-Specific
Knowledge with Advanced Verification Methods

Qualis(R) Design Corporation, the independent leader in advanced
verification methodologies, announces the availability of a powerful new

Ethernet Verification Component for Synopsys' OpenVera(TM) that dramatically reduces the verification time of complex Ethernet-based ***networking products.***

Based on Qualis' advanced plug-and-play Domain Verification Component(TM) (DVC(TM)) architecture, the new component allows verification engineers to quickly build Ethernet verification environments that leverage ***the power of OpenVera and advanced verification methodologies.***

"By welding together our deep experience in verifying complex networking products with advanced, random-based verification methodologies, we've invented a powerful new way to verify protocol-centric designs," said ***Michael Horne, president and CEO of Qualis. "Verification engineers can now***

write advanced testcases for their Ethernet designs within hours of installing our DVC, saving months of effort they would otherwise spend ***creating and debugging the test environment. The verification productivity*** ***improvement is massive."***

The Ethernet DVC is a complete test environment supporting the IEEE ***802.3-2000 specification for 10 and 100 megabit Ethernet, offering*** highly-programmable and extendable stimulus generation, automated response ***checking, and test coverage measurement. The DVC provides an easy interface***

for generating test packets for the MII, RMII, and SMII interfaces, detecting collision conditions, catching protocol violations, and checking ***for compliancy to the industry standard.***

"We are pleased to see Qualis supporting OpenVera and delivering an OpenVera Ethernet DVC as a charter member in the OpenVera Catalyst Program," said Farhad Hayat, vice president of marketing for the ***Verification Technology Group at Synopsys, Inc. "The goal of the OpenVera*** Catalyst Program is to accelerate the availability and proliferation of OpenVera verification intellectual property (IP) to enhance verification ***productivity for our mutual customers."***

Highly Productive Simulation Technology

The Ethernet DVC is much more than a simple Ethernet simulation ***model. The new technology embeds protocol knowledge and advanced*** ***verification techniques in an easy-to-use reusable block. The Ethernet DVC*** dramatically raises the level of productivity of verification engineers by providing a pre-verified Ethernet stimulus generation and automated response checking component that leverages the power of Synopsys' VERA(R) ***test environment. Verification engineers can quickly assemble a*** verification environment for complex Ethernet designs and immediately focus ***on their primary goal: writing testbenches that verify their design.***

"After years of experience helping our networking customers verify their leading-edge designs, we have developed a highly-reusable verification component technology that truly delivers a 10x to 25x improvement in verification productivity," said Janick Bergeron, chief ***technology officer at Qualis. "With the help of our DVCs and our*** patent-pending interconnect technology, verification engineers can now jump ***immediately to writing testcases for their design. And with Qualis'*** expanding library of DVCs, engineers will be able to quickly build multi-protocol environments for complex applications like routers, framers, ***and network processors."***

The new Ethernet Domain Verification Component offers a rich set of features, including:

***-- IEEE 802.3-2000 compliant, comprehensive test environment. Configurable *** for

verifying a system of any number of MII, RMII, and SMII interfaces

-- Leverages the full power of the VERA testbench tool. Full support of SoC/ASIC, FPGA, system, and board-level verification

-- Full support of automatic random, constrained random, and directed testcase
creation

-- Built-in flexible checking mechanism, with on-the-fly protocol checkers/monitors and coverage support

-- Extendable architecture allows user to create standalone test environment or
embed the DVC in a larger existing test environment

***-- Support for creation of higher-layer packets (e.g. TCP, IP). Extensible ***

for
interconnect to future protocol DVCs from Qualis

-- Half-duplex and full-duplex support for 10Mbit and 100M ports, collision
detection and creation capability

-- Full coverage statistics collection for test stimulus as well as Rx and Tx
port

-- Built-in error handling of CRC, short/long packets, corrupt preamble,

corrupt SSE, etc. Support of VLAN tagging, tagged frame creation and checki

ng

(802.1Q). Full support of 802.3x PAUSE operation, control and checking. Ful

l
*** 802.2 support for LLC.***
For a complete listing of features of the OpenVera Ethernet DVC,
visit our website at http://www.qualis.com/dvc.ethernet.vera.pdf.
Pricing and Availability
The Ethernet DVC is available today for OpenVera and supports
interfacing to Verilog and VHDL designs. Annual licenses are priced at $US
7,500, with volume discounts available for customers who run large
regression simulations. The OpenVera Ethernet DVC comes with full
documentation and example configurations for typical Ethernet verification
environments. Qualis also offers full methodology training and support
services for its DVCs, including its QuickRamp(TM) family of DVC deployment
solutions. For more information, visit http://www.qualis.com/dvc.html.
About Qualis Design
Qualis Design is the leading independent verification methodology company offering a rich selection of productivity enhancing Domain Verification Components(TM), methodology consulting, and best-in-class
training services. By leveraging its deep experience in verifying
networking, processor/SoC, and wireless products, Qualis creates verification product solutions that solve the most challenging functional
verification problems in the world. Users of Qualis' revolutionary
technology and verification methodology know-how build sustainable
competitive advantages that keep them on the edge. Qualis is headquartered
in Lake Oswego, Oregon and has development centers in Ottawa Ontario
Canada, and Grenoble, France. To learn more, visit http://www.qualis.com/.

*** COMPANY NAMES: Qualis Design Corp.; Synopsys Inc.***
INDUSTRY CODES/NAMES: BUS Business, General; BUSN Any type of business
DESCRIPTORS: Computer software industry
GEOGRAPHIC CODES/NAMES: 1USA United States
PRODUCT/INDUSTRY NAMES: 7372000 (Computer Software)
SIC CODES: 7372 Prepackaged software
NAICS CODES: 51121 Software Publishers
TICKER SYMBOLS: SNPS
FILE SEGMENT: NW File 649

6/9/119 (Item 5 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

14321930 SUPPLIER NUMBER: 83252142 (THIS IS THE FULL TEXT)
Qualis Breaks the Verification Bottleneck with Powerful Family of Domain
*** Verification Components.***
Business Wire, 0464
Feb 25, 2002
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1279 LINE COUNT: 00118

TEXT:

Business Editors/Technology Writers

*** LAKE OSWEGO, Ore.--(BUSINESS WIRE)--Feb. 25, 2002***

New Verification Components Supporting VERA(R) and Specman Elite(TM) Testbench Tools Give Engineers Access to Unparalleled Verification Productivity With Language Independence

Qualis Design Corporation, the independent leader in advanced verification methodologies, announces the release of powerful Domain Verification Components for verifying complex SoC/ASICs, FPGAs and systems
for networking, wireless and core interconnect. Based upon a novel and
powerful plug-and-play technology, the Qualis Domain Verification Component(TM) (DVC(TM)) technology promises to deliver a 10x to 25x productivity improvement over traditional Verilog- and VHDL-based
verification methods. With DVCs, verification engineers can now reduce the
time it takes to build complex verification environments for their
domain-specific designs from months to just days. Qualis has announced the
immediate availability of SONET, ATM, Utopia 1 and 2, SPI 4.2, and Ethernet

DVCs for its networking DVC family, and is developing additional
networking, wireless and core interconnect DVCs for release in 2002.
*** The new DVCs run as an application layer on top of Synopsys Inc.'s***
VERA and Verisity's Specman Elite by leveraging the powerful verification
capabilities of these testbench tools. By welding together domain-specific
protocol and interface knowledge with advanced, random-based verification methodologies, DVCs offer a dramatic reduction in the time it takes to test
and debug complex designs. With DVCs, engineers spend their valuable time
writing and running powerful testbenches instead of learning, architecting,
writing and debugging complex functional verification environments. A
technology brief describing the new Domain Verification Component technology can be found on the Qualis Web site at

http://www.qualis.com/dvc.whitepaper.pdf.

"After years of working with networking, processor and wireless design teams at industry leading companies, we've developed a verification methodology that works exceptionally well for protocol-based designs," said Janick Bergeron, chief technology officer at Qualis and principal architect ***of the new technology. "We designed the DVC architecture to leverage the*** intrinsic power of the Specman Elite and VERA testbench tools in a ***language-independent way. Each DVC in the platform merges protocol- and*** interface-specific knowledge with our advanced verification methodology, allowing engineers to instantly extract 'expert level' productivity from ***VERA and Specman. And with the plug-and-play interconnect technology, even*** engineers with little HVL or protocol knowledge can quickly build powerful ***verification environments."***

*** Mr. Bergeron is recognized as an industry expert in verification*** methodologies, is the author of the industry verification reference "Writing Testbenches: Functional Verification of HDL Models," and is the ***moderator of the popular email newsletter "Verification Guild."***

A Huge Jump in Verification Productivity

Functional verification of complex SoC/ASICs, FPGAs and systems has not kept up with the huge productivity improvement in recent years from ***design reuse and physical synthesis technologies. Verification is now the*** dominant part of pre-silicon activity and has become the bottleneck in chip ***and system design. A huge jump in verification productivity is required to*** ***keep pace with design.***

"Verification reuse through domain-specific verification component ***technology is finally coming of age," said Dr. William Lattin, former CEO*** ***of Logic Modeling and respected EDA industry veteran. "Verification teams*** can now leverage the power of verification components to manage the ***explosion in system verification complexity."***

DVCs tackle the verification problem by addressing the three critical challenges of modern functional verification: protocol-specific stimulus generation, automated response checking, and test coverage metrics ***extraction. The DVC test stimulus generation blocks conform to industry*** standard protocols and interfaces and allow full random, constrained ***random, and directed test generation. Similarly, the response checking*** blocks support standard protocols and interfaces and automate the ***verification task for large regression simulation runs. Test coverage*** blocks track coverage metrics by extracting coverage statistics from the environment and the simulator, allowing engineers to accurately assess the ***level of *** testcase *** coverage and determine when test goals are met.***

Qualis has bundled all three of these core blocks into an easy-to-use DVC, and created an interconnect technology that makes plug-and-play building of ***layered verification environments a reality. The result is a powerful*** platform that supports all design implementation levels, including ***SoC/ASIC, FPGA, and board/system level.***

Support for Industry-leading Testbench Tools

The Qualis DVC platform leverages the power of the two ***industry-leading testbench tools, Synopsys VERA and Verisity Specman Elite.***

As a charter member of both Synopsys' OpenVera(TM) Catalyst Program and Verisity's Verification Alliance(TM) partner programs, Qualis recognizes these two important testbench tools as the true "Verification Operating ***Systems" of the future. Through collaboration with Verisity and Synopsys,*** the new DVC platform will continue to support the latest enhancements to these languages and simulators, ensuring that engineers can count on full ***DVC compatibility, interoperability, and performance.***

"Qualis' new Domain Verification Components complement our industry-leading verification tools, including VERA, VCS(TM) and Scirocco(TM)," said Manoj Gandhi, senior vice president and general manager ***of the Verification Technology Group at Synopsys. "With Synopsys tools and*** Qualis DVCs, verification engineers can realize verification productivity

gains to reduce total verification cycles."

Full Solutions in Functional Verification

Qualis also offers a premium level of customer support through its ***rich offering of consulting and training services. With the popular*** **QuickRamp(TM) service package, new users of the DVC platform can go from zero knowledge of VERA and Specman to writing powerful testbenches for** ***their designs in just a few weeks. Customers can tap into the deep*** **verification knowledge of Qualis through its offering of advanced** ***verification methodology courses and consulting services. More information*** ***can be found on the Qualis Web site.***

Pricing and Availability

The growing family of Qualis Domain Verification Components is available today for Synopsys VERA and Verisity Specman Elite testbench ***tools and support interfacing to Verilog and VHDL designs. Components are*** **available today for SONET, Utopia levels 1 and 2, ATM, SPI 4 phase 2, and Ethernet; a full listing of current and pending DVCs can be found on the** ***Qualis Web site. Annual licenses start at US $7,500, with volume discounts*** ***available for customers who run large regression simulations. Each DVC*** **comes with full documentation and example configurations for typical** ***domain-specific environments. Qualis also offers full methodology training*** **and support services for its DVCs, including its QuickRamp(TM) family of** ***DVC deployment solutions. For more information, visit*** ***http://www.qualis.com/dvc.html.***

About Qualis Design

Qualis Design is the leading independent verification methodology company offering a rich selection of productivity-enhancing Domain Verification Components(TM), methodology consulting, and best-in-class ***training services. By leveraging its deep experience in verifying*** **networking, processor/SoC and wireless products, Qualis creates verification product solutions that solve the most challenging functional** ***verification problems in the world. Users of Qualis revolutionary*** **technology and verification methodology know-how build sustainable** ***competitive advantages that keep them on the edge. Qualis is headquartered*** ***in Lake Oswego, Ore., and has development centers in Ottawa, Ontario; and*** ***Grenoble, France. To learn more, visit http://www.qualis.com/.***

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*** COMPANY NAMES: Qualis Design Corp.; Synopsys Inc.***

INDUSTRY CODES/NAMES: BUS Business, General; BUSN Any type of business

DESCRIPTORS: Computer software industry

GEOGRAPHIC CODES/NAMES: 1USA United States

PRODUCT/INDUSTRY NAMES: 7372000 (Computer Software)

SIC CODES: 7372 Prepackaged software

NAICS CODES: 51121 Software Publishers

TICKER SYMBOLS: SNPS

FILE SEGMENT: NW File 649

6/9/120 (Item 6 from file: 148)

DIALOG(R)File 148:Gale Group Trade & Industry DB

14321917 SUPPLIER NUMBER: 83252128 (THIS IS THE FULL TEXT)

Qualis Releases SPI 4.2 Verification Component for Verisity Specman Elite.

Business Wire, 0450
Feb 25, 2002
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 947 LINE COUNT: 00097

TEXT:

Business Editors/High-Tech Writers

*** LAKE OSWEGO, Ore.--(BUSINESS WIRE)--Feb. 25, 2002***

Verification Component for Specman Elite Reduces Time-to-First-Test 10-25x by Merging Protocol-specific Knowledge With Advanced Verification Methods

Qualis Design Corporation, the independent leader in advanced verification methodologies, announces the availability of a powerful new Verification Component that supports the SPI level 4 phase 2 protocol specification for the Verisity (Nasdaq:VRST) Specman Elite(TM) simulation
platform. Based upon Qualis' advanced plug-and-play Domain Verification
Component(TM) (DVC(TM)) architecture, the new component allows verification engineers to quickly build complex networking verification environments that leverage the power of Specman Elite and advanced verification
methodologies. The new SPI 4.2 component is Qualis' latest addition to its
rapidly expanding family of networking DVCs for the Specman and VERA
testbench simulators.
*** "The new SPI 4.2 Domain Verification Component joins our SONET,***
Utopia, ATM and Ethernet DVCs as a powerful new platform for verifying
protocol-centric designs," says Michael Horne, president and CEO of Qualis.

"Verification engineers can quickly assemble complex verification environments for their networking designs and begin writing useful testbenches within hours of installing our DVCs, saving months of effort
they would otherwise spend creating and debugging the test environment. No
other solution gives this magnitude of verification productivity."
*** The SPI 4.2 DVC was developed in accordance with the Optical***
Internetworking Forum specification OIF-SPI4-02.0 to provide a complete
protocol test environment, which supports random and directed stimulus
generation, automated response checking and functional coverage. The DVC
provides a constrainable interface for the generation of packets over multiple channels, detects protocol violations and checks for compliancy to
the OIF specification. The SPI 4.2 DVC can be used in conjunction with the
Qualis ATM DVC to support higher layer traffic generation.

Qualis DVCs for Specman Elite leverage the power of Verisity's
popular testbench simulator. As a charter member of Verisity's Verification

Alliance(TM) partner program, Qualis recognizes the role of Specman Elite
as one of the true "Verification Operating Systems" of the future. Through
collaboration with Verisity, the new DVCs for Specman Elite will continue to support the latest enhancements to the e(TM) language and simulator, ensuring that engineers can count on full DVC compatibility,
interoperability and performance.

Simulation technology that delivers results

*** The SPI 4.2 DVC is much more than an interface simulation model. The***

new technology embeds protocol knowledge and advanced verification
techniques in an easy-to-use reusable block. The SPI 4.2 DVC dramatically
raises the level of productivity of verification engineers by providing a
pre-verified OIF-SPI4-02.0 compliant stimulus generation and automated
response checking component that saves the time otherwise spent architecting, writing, debugging and maintaining a Specman test
environment. Verification engineers can quickly assemble a multi-protocol
verification environment for complex datacom designs and immediately focus
on their primary goal: writing testbenches that verify their design.

"With years of experience helping our networking customers verify their leading-edge designs, we have developed a highly reusable

verification component technology that truly delivers a 10x to 25x improvement in verification productivity," says Janick Bergeron, chief ***technology officer at Qualis. "With the help of our DVCs and our*** patent-pending interconnect technology, verification engineers using ***Specman can now jump immediately to writing testcases for their design. And***

with Qualis' expanding library of DVCs, engineers are able to quickly build multi-protocol environments for complex applications like routers, framers ***and network processors."***

*** The new SPI 4.2 Domain Verification Component offers a rich set of*** features, including:

-- SPI level 4 phase 2 comprehensive test environment compliant to

OIF-SPI4-02.0. Configurable for verifying a system with multiple channels o

f
arbitrary traffic

-- Leverages the full power of the Specman Elite simulation engine. Full
support of SoC/ASIC, FPGA, system and board-level verification

-- Full support of automatic random, constrained random and directed testcase
creation

-- Built-in flexible checking mechanism, with on-the-fly protocol checkers/monitors and coverage support

-- Extendable architecture allows user to create standalone test environmen t or
embed the DVC in a larger existing test environment

-- Compatible with the ATM DVC for creation of higher layer packets

-- Full support for DIP-2 & DIP-4 generation, checking and corruption

-- Supports LDVS I/O on data interface, LVTTL I/O on FIFO status and LVDS I /O
on FIFO status

-- Support of calendaring, narrow mode operation and hitless bandwidth reprovisioning

-- Provides in-band address, start/end of packet indication and start-of-FI FO
status indication

*** For a complete listing of features of the SPI 4.2 DVC for Specman,***
visit our Web site at http://www.qualis.com/dvc.spi4.2.specman.pdf.

Pricing and availability

*** The SPI 4.2 DVC is available today for the Verisity Specman Elite***
platform and supports interfacing to Verilog and VHDL designs. Annual licenses are priced at US $10,000, with volume discounts available for ***customers who run large regression simulations. The SPI 4.2 DVC for Specman***

comes with full documentation and example configurations for typical SPI ***4.2 verification environments. Qualis also offers full methodology training***

and support services for its DVCs, including its QuickRamp(TM) family of

DVC deployment solutions. For more information, visit
http://www.qualis.com/dvc.html.

About Qualis Design

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networking, processor/SoC and wireless products, Qualis creates verification product solutions that solve the most challenging functional
verification problems in the world. Users of Qualis revolutionary
technology and verification methodology know-how build sustainable
competitive advantages that keep them on the edge. Qualis is headquartered
in Lake Oswego, Ore., and has development centers in Ottawa, Ontario; and
Grenoble, France. To learn more, visit http://www.qualis.com/.

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QuickRamp are trademarks of Qualis Design Corporation. Specman Elite and
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property of their respective owners.

*** COMPANY NAMES: Qualis Design Corp.; Verisity Design Inc.***
INDUSTRY CODES/NAMES: BUS Business, General; BUSN Any type of business
DESCRIPTORS: Computer software industry
GEOGRAPHIC CODES/NAMES: 1USA United States
PRODUCT/INDUSTRY NAMES: 7372000 (Computer Software)
SIC CODES: 7372 Prepackaged software
NAICS CODES: 51121 Software Publishers
FILE SEGMENT: NW File 649

6/9/121 (Item 7 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

13923566 SUPPLIER NUMBER: 79194953 (THIS IS THE FULL TEXT)
Acterna Strengthens Wireless Network Test Portolio With UMTS Tester; New Hardware and Software Upgrades Speed Up Performance Testing for 3G Mobile
*** Networks.***
Business Wire, 2163
Oct 17, 2001
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 706 LINE COUNT: 00062

TEXT:

Business Editors/Hi-Tech Writers
*** BARCELONA, Spain--(BUSINESS WIRE)--Oct. 17, 2001***

Acterna (NASDAQ:ACTR) today announced the release of the Acterna 8610 3G Mobile Test Solution for the Universal Mobile Telecommunications System (UMTS), the company's first wireless network tester for 3G
standards.

The Acterna 8610 3G Mobile Test Solution gives manufacturers and network operators a powerful tool to test the behavior and performance of
networks by realistically simulating network conditions. The new capability

will be introduced by Acterna today at the UMTS Congress 2001 in Barcelona,
Spain.

The Acterna 8610 3G Mobile Test Solution speeds up and simplifies
the test phases for the user by offering a multi-user networked system.
Intensive tests can be performed on multiple interfaces and using different

types of technology without having to perform separate tests.

In addition, The Acterna 8610 3G Mobile Test Solution employs OPTEC(TM) (Optimized Testcase Composer), a method that allows users to write test cases quickly and efficiently and eliminates the need to know ***complex programming languages such as C or C++. Users only need to know the***

protocols tested.

"As wireless carriers migrate to 3G platforms they rely increasingly on test and management solutions like the Acterna 8610 3G Mobile Test Solution to ensure operational performance," said Andreas Herren, managing ***director for Acterna's Wireless Networks Division. "With our new UMTS*** capability Acterna has made it easy and affordable for our customers to ***upgrade their networks to support emerging 3G networks."***

The Acterna 8610 product line is a forward-looking solution for test laboratories, and hundreds of these systems for current standards like GSM, CDMA and TDMA are now in daily use around the globe, meeting the demanding ***requirements of manufacturers and network operators. The 8610's hardware*** and software components are combined to form a ready-to-go test system that ***can meet all deployment requirements.***

There are no restrictions on the number of components that can be used with the tester, ranging from a solution for testing PBXs to a large ***system capable of handling all of the tests required by a switching center.***

UMTS is the 3G wireless technology standard being implemented by ***European carriers. UMTS provides service in the 2GHz band and will offer*** ***global roaming and personalized features. It also is expected to provide*** greater capacity, faster data speeds and enhanced versions of the services ***already available on most handsets.***

Telecommunications companies have paid approximately $100 billion for UMTS licenses in several European countries, and the UMTS Forum ***(London) predicts UMTS deployments to begin in 2002.***

The Acterna 8610 Telecom Test System supports all types of tests, including functional tests (interworking, interoperability, features, ***regression) and performance tests (load, stress, ruggedness, continuity).***

About Acterna Wireless Solutions

Acterna offers a wide range of solutions to meet the testing requirements of wireless carriers, including testing of handsets and ***devices, RF testing and network testing. Acterna is the world leader in*** mobile handset test equipment used by service providers to determine ***specific problems with mobile phones and validate the need for repair.***

Acterna's Air Interface Instruments and network systems are ***recognized leaders in their field and are deployed around the world.*** Acterna's R&D labs, which invested $145 million in fiscal 2001, are actively developing testing solutions for all of emerging wireless services ***and networks.***

About Acterna

Acterna is the world's largest provider of test and management solutions for optical transport, access and cable networks, and the second ***largest communications test company overall. Focused entirely on providing*** equipment, software, systems and services, Acterna helps customers develop, install, manufacture and maintain their optical transport, access, cable, ***data/IP and wireless networks.***

The company produces annualized revenue of more than $1 billion and ***serves customers in more than 80 countries. Acterna is a subsidiary of*** ***Acterna Corporation (NASDAQ:ACTR). Information about Acterna can be found*** ***on the Web at www.acterna.com.***

Note to editors: All company or product names mentioned in this press release may be trademarks or registered trademarks of the respective ***companies with which they are associated.***

COMPANY NAMES: Acterna Eningen GmbH

INDUSTRY CODES/NAMES: BUS Business, General; BUSN Any type of business
DESCRIPTORS: Testing and measuring equipment industry
PRODUCT/INDUSTRY NAMES: 3825000 (Test & Measuring Equip)
SIC CODES: 3825 Instruments to measure electricity
NAICS CODES: 334515 Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals
FILE SEGMENT: NW File 649

6/9/122 (Item 8 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10774048 SUPPLIER NUMBER: 53654192 (THIS IS THE FULL TEXT)
New Products.(Buyers Guide)
Communications News, 36, 1, 80(1)
Jan, 1999
DOCUMENT TYPE: Buyers Guide ISSN: 0010-3632 LANGUAGE: English
RECORD TYPE: Fulltext
WORD COUNT: 1943 LINE COUNT: 00165

TEXT:

Smooth operator goes virtual

VIRTUAL OPERATOR from Registry Magic is a speech-recognition auto attendant and call-routing system designed to enhance corporate telephone ***systems. Virtual Operator is a turnkey solution that attaches to a*** ***business' telephone system and performs the tasks of a live operator. It*** understands natural speech, eliminates the need for inefficient touch-tone ***menus, and quickly transfers calls to the proper person or department.***

Targeted at businesses with 10 to 500 employees, Virtual Operator can ***answer and route up to 12 calls simultaneously. Callers are no longer*** ***subjected to tedious touch-tone menus and lengthy directories. Using*** Registry Magic's advanced Dialogue Detection technology, the Virtual ***Operator understands your callers, however they phrase their requests. Talk***

Thru technology even lets callers interrupt the Virtual Operator and still ***be transferred quickly and correctly.--Registry Magic***

Circle 324 for more information

Tactical NRZ-to-CDI converter

BRIDGE THE TWO MOST POPULAR protocols involved in tactical ***communications with the new NRZ-to-CDI converter from DNE. The CV-2048*** allows NRZ devices to be positioned in tactical areas as needed through the ***use of the CDI cabling and the CV-2048. NRZ is prevalent among data*** ***routers, hubs, switches, video cameras, and modems. CDI is used where*** wire-based connections are needed to transmit high-speed data over long ***distances.***

The CV-2048 is fully compatible with the DNE AN/FCC-100(V)9 ***multiplexer and can address numerous remote data access applications.*** Coupling the CV-2048 converter with the AN/FCC100(V)9 multiplexer allows data communication and encryption devices to be physically grouped to simplify monitoring and control of communications links, CDI interfaces on data routers can be configured to run at higher speeds, and the reach of video cameras can be extended to be positioned over 3 km from a satellite ***terminal. The CV-2048 can also be used to bridge devices onto modern*** ***high-speed network technology, such as ATM switched networks.--DNE*** Technologies

Circle 326 for more information

Keep it clean

POSITIVE AIR FLOW cabinet from Devtek Electronic Packaging Systems is targeted for indoor use where environmental conditions dictate a level of ***protection from airborne dust higher than NEMA 1 but less than NEMA 12. The***

design of this economical enclosure uses a high-volume replaceable filter
system. It also features a specially configured top-mounted fan tray
kit.--Devtek Electronic Packaging Systems

Circle 328 for more information

Simplified replication

DATA REPLICATION SERVER from Arkona enables companies to incrementally and automatically update traditional database content, semi-structured reference documents, and other forms of enterprise
applications. Universal Update Version 1.0 provides a centralized data
distribution "hub" for almost any corporate information source. It tracks
information, manages updates and modifications, and delivers information to
mobile and distributed users. With Universal Update, complex replication
can be set up in minutes instead of days and weeks.

The server and client routes both inbound and outbound information
through customized application adapters. The adapters let Universal Update
communicate with most data sources including relational and free-form data,
enterprise applications, and legacy systems. Information assets are
protected by delivering information based on individual user
profiles.--Arkona, Inc.

Circle 325 for more information

Multimedia converter

MEDIA CONVERSION CENTER from Transition Networks is ideal for
high-density enterprise networks. The Media Conversion Center is a
manageable, multiprotocol and multimedia converter mounting option. The
unit features a 16-slot chassis with an optional redundant power supply, optional SNMP management, and is capable of accepting Ethernet, Fast Ethernet, fiber mode conversion, ATM, FDDI, Token Ring, and Gigabit
Ethernet conversion cards. The latest update to the Media Conversion
Center's Management Module is support for HP OpenView, one of the most
widely used management platforms in the enterprise environment.--Transition

Networks

Circle 331 for more information

Your Frame Relay Passport

SMALL TO MEDIUM-SIZED multisite businesses can consolidate all traffic on a single public Frame Relay facility with a new product from
Nortel. The Passport 4400 Access Device Phase 3 integrates voice, fax, IP,
video, and legacy traffic over a single WAN connection, saving money on
duplicated carrier facilities and operations costs.

With the Passport 4400 Phase 3, the user can access all nodes in the network by setting up a single permanent virtual circuit (PVC) from his or
her site to the central site switch. This allows the user to tunnel
multiple end-to-end Frame Relay switched virtual circuits (SVCs) within a
single PVC. A specific quality of service can be assigned to applications
transported over the tunneled SVC, so multiple types ,of traffic--SNA, LAN,
voice--can be supported to multiple sites over a single PVC. An advanced
traffic management system ensures that mission-critical traffic always gets through, while the lowest priority traffic is guaranteed a minimum
throughput.

The Passport 4400 Phase 3 features a self-learning address server, ClearVoice compression and echo cancellation technology, and a PC-based
configuration tool for quick set up of commonly used multiservice features.

The unit also supports flexible network link resilience through WAN backup to keep the network operational if the primary link or Frame Relay service
provider's network fails.--Nortel Networks

Circle 323 for more information

Host with the most

ENTERPRISES CAN OUTSOURCE the design, installation, and management of complex, custom hosting operations to a new family of online hosting
services from MCI WorldCom Advanced Networks. Latest additions to MCI's
Hosting and Electronic-Commerce unit are the Enterprise-Class Hosting and

Hosting Professional Services. MCI WorldCom's Enterprise-Class Hosting
offers integrated management of a company's hosting, networking, security,
and custom application services. The new service includes hosting
configuration and network integration services; a designated project manager, a specially trained Enterprise Management Team, 24 x 7 site monitoring and management; and custom applications supported on standard
and non-standard platforms. Enterprise-Class Hosting can have multiple
networking options including Internet, VPNs, Frame Relay, and private dial
services.--MCI WorldCom

Circle 321 for more information

Mighty mini E1/T1 DACS

MINI DACS E1/T1 CONVERTER from Loop Telecom comes in 2, 3, or 4
ports, which can be any mix of E1 and T1. With the V4300, full time slot
interchange is provided, with conversions between coding law and signaling
where necessary. The mini DACS is the size of half a rack unit, and it can
be either AC or DC powered. Users can configure and manage the V4300 using
either a terminal connected to the console port or through the Ethernet
port using SNMP or Telnet. Simple monitoring is accomplished by using the
front panel LCD display. Despite it's small size and low cost, full
performance monitoring and alarms are provided for all ports. To aid
diagnostics, all loopback types are provided and remote loopback commands,
sending and receiving, are supported.--Loop Telecom

Circle 333 for more information

RF planning and more

OFF-THE-SHELF network planning tool from MapFactory is targeted for
PCS, LMDS, and MMDS professionals. AlphaMap Telecom/Wireless combines
multiple Sets of essential network buildout information into a single,
easy-to-use, and fully integrated desktop mapping package. The product
features an array of benefits that go beyond creating RF propagation and network planning maps, including bundled information for supporting sales,
marketing, and customer service.

AlphaMap Telecom/Wireless is a set of nine fully integrated
information layers that are available individually or as a bundled package.

These information layers--such as heights and dimensions of every structure higher than two stories with an accuracy of better than one meter-are crucial to RF engineers who need to calculate the propagation and
attenuation of radio signals in densely populated urban and suburban areas.

Features include high-resolution aerial imagery, bald-Earth digital elevation models, canopy digital elevation models, satellite imagery, and
digital street maps and labels. All of the information in AlphaMap
Telecom/Wireless is current and fully registered.--The MapFactory

Circle 327 for more information

You're in (remote) control

REMOTE ANALYSIS SYSTEM (RAS) from Digitech brings real-time distributed network analysis (from multiple users) to any location from any
location worldwide. The client/server-based RAS offers the expert
functionality of a full protocol analyzer in a rackmountable platform. The
system performs in-depth analysis and problem-solving for Fast Ethernet,
Ethernet, and Token Ring LANs.
*** The RAS minimizes bandwidth between client/server to 10 kbps. It also***

offers simultaneous data capture to RAM and/or hard drive from highly
utilized networks. The RAS also features Quick Filters, advanced filter
libraries, and multiple view modes. The unit ensures distributed network
access via network in-band and dial-up interface connections.--Digitech
Corp.

Circle 322 for more information

Telecom test

USERS OF AMERITEC CALL GENERATORS can develop large automatic test
environments using FeatureCall 3.5, the latest version of Ameritec's test

management tool. Two standout features of the new release are the
****** TestCase *** and TrafGen tools. *** TestCase *** provides the user with***
tools to schedule tests to be run days, weeks, and months in advance for up
to 32 units with a mix of physical interfaces. Individual test cases can be
automatically downloaded from a computer's hard disk to any one, or all of
the call generators on the basis of the instruction in *** TestCase ***.
FeatureCall automatically collects statistics and errors into files so that
the test engineer can review results. TrafGen is a traffic profiler that
allows the user to automatically change the "calf per hour" rate. The call
rate can be increased or decreased based on a call rate schedule.--Ameritec
Corp.

Circle 329 for more information

*** Your enterprise oughta' be in pictures ...***

DIGITAL VIDEO SYSTEM from Optelecom is a low-bandwidth MPEG-2 video
access product designed for business network applications. The Transform
DVS features state-of-the-art video compression technology to provide users cost-effective, easy-to-use solutions for meeting enterprise needs for
corporate communications, distance learning, and video surveillance.

At the heart of the Transform product is a real-time embedded operating system that allows simple and reliable plug-and-play operation
from this standalone network appliance. It features a built-in HTTP server
that offers easy Web-based management and can be controlled from a standard
browser anywhere on the network or through the Internet. The Transform
product also features industry-standard WAN and LAN interfaces, a wide range of delivery profiles, inverse mux capabilities, and interactive or one-way decoder options that allow for seamless integration into almost any
type of network.--Optelecom, Inc.

Circle 332 for more information

Class-act cabinets

"ELEGANT" CABINET SOLUTIONS distributed by Power & Telephone Supply offer a perfect choice for datacom equipment installations where neat
arrangements and easy access are required. The Elegant Line from Elgadphon
is designed to make installation, equipment patching, and wire management
very friendly and easy. Racks and cabinets feature a special wall-mounting
system, metal/Perspex front door with lock, direct access to front and rear
sides, and pull-out telescopic drawers for hubs and active components.
Sizes range from one patch panel and one hub for 24 users to four patch
panels and four hubs for 96 users.--Power & Telephone Supply Co.

Circle 330 for more information

INDUSTRY CODES/NAMES: BUSN Any type of business; CMPT Computers and Office Automation; TELC Telecommunications
FILE SEGMENT: CD File 275

6/9/123 (Item 9 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

08739758 SUPPLIER NUMBER: 18322969 (THIS IS THE FULL TEXT)
Network sales make Hungary an investment *** testcase ***. (sale of gas **distribution firm stocks)**
Griffiths, Mark
Petroleum Economist, v63, n3, pVI(2)
March, 1996
ISSN: 0306-395X LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 2023 LINE COUNT: 00165

ABSTRACT: Hungary has been attracting foreign investments due to the sale of controlling stocks of low-pressure gas distribution firms in the ***country. However, citing a 1988 law, some local officials pointed out that*** **majority investors should offer the same stock prices to minority** ***stockholders for 90 days after the date of purchase. Despite the legal*** **impediment, the local government may not have the sufficient financial** ***strength to force the issue.***

TEXT:

The sale of shares in Hungary's gas distribution companies has not been without difficulties, but, overall, the process has been judged a ***success.***

Lucrative sales of controlling stakes in Hungarian provincial gas networks have focused the attention of governments in eastern Europe on the possibility of attracting foreign capital to modernise national and local ***gas pipelines. Hungary obtained unexpectedly high prices from the sale of*** **50% plus-one-share in each of its five regional low-pressure gas** ***distributors (Egaz, Degaz, Kogaz, Ddgaz and Tigaz) in December 1995.*** *** But there is already a problem. Legal questions have been raised that*** **could threaten the foreign buyers (Gaz de France, Ruhrgas/VEW, and Bayernwerk/ EVN) with surprisingly heavy costs if they turned out to be** ***serious. Though they remain untested in court, they reflect an*** **uncomfortable political background to the current euphoria that Hungary is** ***leading the region in market reform. The legal questions are being raised*** **by the leaders of some municipalities, who have suggested that a 1988 law - requiring majority buyers to offer the same share price to minority owners for 90 days after buying the controlling stake - also applies to** ***non-Hungarian buyers. Municipal councils retain 40% of each of the five*** ***distributors.***

While many local councils are chronically short of cash, however, trying to force the new majority owners to make matching offers would be ***too confrontational for most Hungarian mayors or council officials. The*** **current discussion is more significant as a sign of widespread unease at foreign ownership of assets that are seen as strategic, and a deep popular concern that, despite the huge size of the deal, the best deal may not have** ***been struck. It is embarrassing for Hungary's State Privatisation and*** **Holding Company (APV) that the legal ambiguity survived the privatisation process, but the public relations nightmare of hostile litigation and millions of dollars of forced extra share purchases for the foreign buyers** ***is unlikely to become reality.***

High level of bidding

The sell-off, easily the most successful of the privatisations that occurred in late November and December 1995, is important not just for the ***gas business. The deal stands out in several ways. Lenders to and owners of***

Italgas/Snam and Gaz de France, for example, should be surprised at the ***high level of bidding, especially between those two companies.***

Tigaz was probably the main prize for the buyers - it was the only ***distributor British Gas entered a bid for. It covers a much larger area*** **than any other network and, as a measure of its importance, rules prevent** ***the successful buyer of Tigaz from owning another network. A buyer could*** ***own any two of the other distribution companies, however. The pattern of*** **first-round bids makes it look as if Italgas/Snam and Gaz de France were each determined to get either Tigaz or two distributors, and as if they** ***knew of each other's determination. They were the top two first-round*** **bidders for four out of the five firms and, in the only case out of those four where Gaz de France topped Italgas/Snam, it had to pay over four times** ***face value to do it. A second round had to be held for one distributor,*** **Kogaz, and Bayernwerk/EVN raised its initial $48m offer to a final bid of** ***$67m.***

At the same time as the sale of distribution companies, Budapest City Council was separately selling a 39% stake in Fogaz, a smaller distributor

serving only the capital city of Budapest, for $125m, to VEW/Ruhrgas (here ***in an 80%/20% consortium).***

Although shares in the distribution companies have been sold, the national network of high-pressure and medium-pressure pipelines remains the property of the Hungarian Oil and Gas Company, MOL, now owned by a ***combination of private investors and public sector funds.***

What will happen to the remaining shares in the five big distributors ***is still undecided. Employees will have the chance to buy, at half price,*** ***2-4%. It may turn out to be more than this: the remaining 6-8% is being*** held by the APV, while discussions continue over selling more to staff or ***floating blocks of 10% on the Budapest Stock Exchange. This second option*** would need some shares to be bought back from local municipalities, ***however. As well as the tempting notion of legally forcing foreign*** stakeholders to buy them out at competitive bid prices, hopeful village mayors are also talking up this more modest resale of small stakes to the ***APV.***

FINAL PRICES PAID FOR THE DISTRICTORS

Final prices paid	US $	% of share face value
*** Ddgaz - Ruhrgas/VEW	52.0m	258.7***
*** Kogaz - Bayernwerk/EVN	67.3m	273.4***
*** Egaz - Gaz de France	77.0m	416.2***
*** Degaz - Gaz de France	92.0m	199.6***
*** Tigaz - Italgas/Snam	171.9m	273.3***

Investment the priority

For the buyers, the priority will be investing in the upgrading of ***equipment. Ruhrgas/VEW has publicly pledged to invest around $50m in Ddgaz*** ***over the next three years, and $77.7m over the following five years. Gaz de***

France in December described its priorities in Degaz as improving management in an already mature gas market, but saw more scope and need for expansion and spending on equipment in the northern Egaz region, where the market is not mature, despite the presence of relatively affluent towns, ***such as Szombathely, Sopron, and Gyor, near the Austrian border.***

The Egaz area will also be crossed by two major gas pipelines, helping ***to explain the fierce bidding for what is a small border region. The*** Gyor-Baumgarten two-way, 700-millimetre pipeline will join the high-pressure MOL network in Egaz territory, and the pipeline planned by Panrus, a Gazprom-MOL joint venture, will cross both Tigaz and Egaz ***regions. By contrast, Degaz, covering some of the thinly populated Great*** Plain, and without the east-west transit importance of Tigaz, is likely to ***see the smallest amount of capital investment in the near future. That is,*** unless cross-border projects to help bring north some of Romania's ***estimated reserves of 3.5 to 4 trillion cubic feet (cf) of gas reserves*** ***come to fruition.***

*** Hungary is more a gas producer than an oil producer. Domestic*** production of gas is around 170 billion cubic feet a year (bn cf/y) and meets half the country's gas demand, while oil production meets just a ***quarter of demand.***

MOL is still the only gas producer, with around 300 operating gas ***wells against 1,000 producing oil. Most of its gas production is in the*** central south of the country, around the towns of Szeged and ***Hodmezovasarhely. MOL may soon have competition, however. A concession*** round that started in mid-1994 has already produced early well-drilling in blocks that are all outside the traditional gas-rich area of the central ***south. Coastal, Mobil, Occidental, and a company called Bluestar -*** US-incorporated, Hungarian-run, and headquartered in Rome - are exploring ***five blocks. Mobil and Oxy are exploring one each separately, and one*** ***together as a consortium. MOL has until October 1997 fully to explore the*** ***blocks reserved for it, after which an open season is scheduled to begin.***

Pricing predicament

*** Hungary is most typical of the region in its consumption patterns.***
Throughout former Comecon and similar economies, changes in industry have been rapid - entire sectors that were once major customers for energy, such
as textiles, steel, or heavy engineering, have almost collapsed. There are
also problems in other sectors. District heating systems in tower blocks
are chronically wasteful, for example, and around 20% of Hungarians live in
homes with no individual control over temperature or even an on-off option.

This was not a problem when subsidised energy was a given. But there is
pressure on Hungary's government to make companies like MOL saleable by allowing them to charge world energy prices - and customers often cannot
use energy more efficiently to compensate for the increased prices.
Exporters like Gazprom have forced the pace of price liberalisation but, the need to make gas retailers, such as the Hungarian ones, attractive to
foreign investors has produced resentment among voters. As a result,
opposition to the sell-offs is slowly building up.

However, freer markets are bringing more choice to some Hungarians,
especially in the villages. Until the pipeline network expands, liquefied
petroleum gas, Hungary's villages are going to be served by increasingly
competitive LPG players. Existing bottled gas businesses, Totalgaz and
Primagaz, were joined in October 1995 by Shell Gas Hungary. It established
the country's 13th filling plant in the central Hungarian town of Szekesfehervar, and aims to bottle 10,000-30,000 tonnes a year (t/y), in a
250,000 t/y market.

The controversy over urban heating price hikes, means that the
excitement over the gas distributor sell-off may be premature. However, the

sales of the five networks at high prices to four competing buyers had the effect of turning international investor opinion around on the whole
Hungarian reform programme within the space of two months.
*** The success was badly needed. The gas privatisations came at the same***
time as an undersubscribed private placement of 19%, instead of the planned 25%, of state oil and gas firm, MOL, to undisclosed foreign buyers, at the
bottom of the price range asked. And within Hungary, public opinion is
still divided over the merits of selling off valuable national assets.

This was shown by a constitutional attempt, in October 1995, to stop
the gas and electricity privatisations. A right-wing group collected over
72,000 signatures in a petition specifically against the energy privatisations (Hungarian law requires a special parliamentary debate on
any topic if there is a petition of more than 50,000 signatures).

Stakes were high, as the government struggled to persuade IMF negotiators discussing a $300m standby loan that long-delayed
privatisations really would happen this time. Few people were surprised
when more than 30,000 of the signatures were declared invalid, avoiding the need for a debate in parliament - a delay which might have derailed the
tight privatisation schedule.

No relief at hand

Now the sales have gone ahead, public attention is focusing on how the extra money from the sales should be used to benefit Hungarians, who saw
their real incomes fall by 10% in 1995. Most of that 10% was during the
half-year after a package of reforms was put through by finance minister,
Lajos Bokros. It appears that the possibility of rent strikes should now be

factored into calculations of future profits for the gas retailers. The
understated style of much public debate in Hungary hides widespread bitterness and misunderstanding of the successive price rises that have
raised previously subsidised energy to world levels. Rises of 25% in gas
prices and 18% in electricity prices - long timetabled for March 1996 - are
being described by Hungarian consumer groups as wicked and cruel. But
another rise of at least 5%, set for October 1996, will be needed to
approach international price levels.

The gas network sales have made Hungary a privatisation testcase

in two ways. Firstly, they have provided an example of how a government can

manage an auction to extract the maximum cash benefit - APV officials are rightly proud of their negotiating skills in the sales and other
governments will be keen to sell as profitably. Secondly, Hungary is also
testing out another area - the political acceptability of utility sales to foreigners when changes of ownership coincide with long-needed energy rises
and economic difficulties for voters. Foreign investor and lender approval
for Hungary's plans to repay its debts, among the heaviest per head in the region, hinges on cutting the country's welfare spending precisely at a
time when most Hungarians believe it urgently needs to be increased. In the

1996/97 winter, this debate will focus on heating prices, and gas and
electricity utility profits.

SPECIAL FEATURES: illustration; table; chart
INDUSTRY CODES/NAMES: OIL Petroleum, Energy Resources and Mining
DESCRIPTORS: Gas transmission industry--Finance; Foreign investments--Economic aspects; Hungary--Business and industry
PRODUCT/INDUSTRY NAMES: 4923000 (Gas Transmissn & Distributn)
SIC CODES: 4920 Gas Production and Distribution
FILE SEGMENT: TI File 148

6/9/124 (Item 10 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

08678834 SUPPLIER NUMBER: 18305518
Network sales make Hungary an investment *** testcase ***.(A Special Report:
Gas in Europe)
Griffiths, Mark
Gas World International, v200, n3, pVI(2)
March, 1996
ISSN: 0960-1635 LANGUAGE: English RECORD TYPE: Abstract

ABSTRACT: Governments in eastern Europe have been encouraged to attract foreign capital to improve their gas pipelines due to profitable network
sales in Hungary. Hungary's sale of 50% plus-one-share in each of its five
regional gas distributors in Dec. 1995 posted high prices. However, there
are certain legal issues which could bring about heavy costs on foreign
buyers. These are being raised by some of the leaders in municipalities.

SPECIAL FEATURES: illustration; table; map
INDUSTRY CODES/NAMES: INTL Business, International; OIL Petroleum, Energy Resources and Mining
DESCRIPTORS: Gas distribution--Evaluation; Gas industry--Analysis; Hungary--Business and industry
PRODUCT/INDUSTRY NAMES: 4923200 (Gas Distribution); 4920000 (Gas Utilities)
SIC CODES: 4920 Gas Production and Distribution
FILE SEGMENT: TI File 148

6/9/125 (Item 11 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

08409794 SUPPLIER NUMBER: 17852401 (THIS IS THE FULL TEXT)
MICROCOSM TAKES OFF WITH MEMS SOFTWARE COMMITMENTS FROM FORD AND TI

PR Newswire, p124CHW010
Jan 24, 1996
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 748 LINE COUNT: 00082

TEXT:

Former ISS Founder, Mike Jamiolkowski, Launches MEMS Design Automation Company

*** RESEARCH TRIANGLE PARK, N.C., Jan. 24 /PRNewswire/ -- Microcosm***
Technologies Inc., has taken a bold step in positioning itself at the
forefront of the MEMS software industry by unveiling MEMCAD -- its core MIT -- developed microelectromechanical systems software for next generation
MEMS products. The announcement was made by Microcosm cofounder and
president, Michael Jamiolkowski, a former cofounder and vice president of
Integrated Silicon Systems.

Beginning with Ford and TI

Microcosm debuts with key partnership contracts with Ford Microelectronics and Texas Instruments (NYSE: TXN) as part of the company's
CAD Partnership Program. Ford will use Microcosm software for the design
and analysis of MEMS devices for automotive applications. Microcosm will
develop specific three dimensional modeling capabilities that will allow Ford to project and perfect the geometries of future automotive devices, as
well as enhance processing and manufacturing analysis. "I am very
encouraged that Microcosm has stepped forward to commercialize MIT's MEMCAD
software. Ford Microelectronics is excited about the possibilities at hand
in a partnership program with Microcosm," said Dr. William Tang, Research
Manager at Ford Microelectronics in Colorado Springs.

Microcosm has also initiated a partnership program with Texas
Instruments. Phil Congdon, TI's Manager of Photonics and Micromachining at
the company's corporate research laboratory in Dallas, said that TI will use Microcosm's MEMCAD software to model several micromachined devices including a spatial light modulator, optical switches, sensors, and process
monitoring test structures. Additional planned effort will include the
joint development of process and material characterization structures along
with corresponding software extensions.

The MIT Connection

As a core technology, Microcosm will utilize MEMCAD, a computer- aided
design software suite developed by M.I.T. and licensed by Microcosm. Dr.
Stephen D. Senturia, Weller Professor of Electrical Engineering at MIT and
a visionary in the development of CAD tools for MEMS, stated, "I believe that the future of the MEMS field depends on the widespread availability of
robust and versatile CAD tools. I am pleased that Microcosm is committed to

providing those tools, and I look forward to a constructive and cooperative
relationship between Microcosm and the MEMCAD program at MIT."

Through extensive development, testcase **performance and customer evaluations, MEMCAD is the most advanced and promising MEMS CAD suite**
available today. Where in the past, tools for MEMS design have been
fragmented and inefficient, MEMCAD integrates tools in a single seamless
environment. According to Mr. Jamiolkowski, Microcosm's MEMCAD software
offering is expected to become the industry standard for MEM product
design. The first commercial release of Microcosm's MEMCAD software will
take place by March 31. The company plans to make its software suite
available industry-wide to qualified CAD partners during 1996. "The company

plans to expand its own proprietary development effort, license additional
technology and pursue further MIT collaboration," Mr. Jamiolkowski stated.
*** The M.I.T./Microcosm relationship was further solidified with the***
naming of Dr. John Gilbert as Microcosm's Chief Technical Officer. A
cofounder of Microcosm, Dr. Gilbert was previously an M.I.T. research
scientist responsible for the technical management of the MEMCAD system. He

PC Week, v12, n31, p77(2)
August 7, 1995
DOCUMENT TYPE: Evaluation ISSN: 0740-1604 LANGUAGE: English
RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1353 LINE COUNT: 00119

ABSTRACT: Segue Software Inc's QA Partner 3.0, priced at $2,995 for PC
platforms and $6,995 for Unix, offers many sophisticated application testing features but lacks the planning and reporting tools found in
competitors. Its biggest advantage is cross-platform support; the software
runs on Unix, Windows, Windows NT, OS/2 and the Macintosh. The program
automatically creates test scripts whenever a user interaction with the application undergoing testing is recorded and it has a readily
customizable interface. Test execution involves playing back scripts and
verifying and debugging them; QA Partner's playback features are very
strong, and its debugging tools are solid. Errors are highlighted in red,
and the program automatically compensates for unexpected events that may
occur during testing. Reporting functions are not included in the main
product; Segue offers them in the companion QA Planner product, which costs
an additional $1,495 to $2,995. Software Quality Automation's TeamTest is a

better choice as an integrated test product.

TEXT:

IS organizations searching for a straightforward cross-platform GUI test tool for their quality-assurance engineers and programmers should
evaluate Segue Software Inc.'s QA Partner 3.0.

This June release gains an easier test script language, called Visual 4Test; automated Testframe creation; and support for multiple application
states.
*** QA Partner competes with Mercury Interactive Corp.'s WinRunner 3.1,***
Software Quality Automation Inc.'s TeamTest 3.0, and Sterling Software
Inc.'s Answer:Testpro 2.5 for Windows (see comparative review, Nov. 28,
1994, Page 89) in the GUI test-tool marketplace. Unlike its competitors,
however, QA Partner supports 25 platforms, including Windows, Macintosh,
and Unix.

Segue shipped late last month its new QA Planner product, which provides such features as planning, management, and reporting of software
testing not included with QA Partner.
*** Version 3.0 of QA Partner ranges in price from $2,995 for PC platforms***

(Windows, Macintosh, NT, OS/2) to $6,995 for Unix platforms. Prices for QA
Planner will range from $1,495 for PC platforms to $2,995 for Unix
platforms. The company is expected to ship a Windows 95 version in late
August.

Test design and creation

A good software test begins with careful planning, but it must be
flexible enough to run with multiple products, such as Microsoft Corp.'s
Visual Basic and Powersoft Corp.'s PowerBuilder. Though QA Partner 3.0
doesn't include any planning features, the interface used to record and
customize scripts is one of the best we've seen.

Like such competing products as TeamTest, QA Partner automatically creates test scripts when the product records a user's interaction with the
application undergoing testing.

For example, after clicking on QA Partner's record button and selecting File/Open from the main menu of a text editor application, the
recorder automatically generated the command (TextEditor.File.Open.Pick)
into the 4Test Script editor.

We were able to easily customize QA Partner's interface and some of
its functions to meet our needs. For example, we changed the 4Test editor's

color scheme for displaying keywords and other strings by selecting new

colors from the options menu (see screen, above).

Visual 4Test, the product's new outlinelike script editor, shaves testing time by simplifying complex test-script creation into a nonprocedural task that most 4GL developers will have no difficulty ***mastering.***

QA Partner test developers will be able to locate and modify specific test components faster using Visual 4Test, because they can drill down from a general test area to the specific 4Test code that controls that area of ***testing.***

For example, we were able to double click on a particular line of code--testcase **Test1--in our 4Test editor to display an additional nine lines of code that perform the functionality test on one of the dialog** ***boxes in our test application.***

In addition, the Visual 4Test editor displays keywords, verbs, and commands in different colors, so testers will have an easier time searching ***for specific commands in their scripts.***

Users will be able to get test planning, management, and report ***functions with Segue's upcoming companion product, QA Planner. However,*** ***SQA's TeamTest includes these features in one package for $2,495.***

Test execution

Although test creation is the most important aspect of testing, the playback, verification, and debugging of those scripts is also essential to ***a successful test. QA Partner offers great playback features as well as*** ***solid verification and debugging capabilities.***

We were able to test multiple tasks, which QA Partner calls TestCases, and review the results via the easy-to-use Visual 4Test (see screen, Page ***77), which displayed our script. This editor made viewing test results*** **easier than using Mercury Interactive's WinRunner or Sterling Software's** ***Answer:Testpro.***

Like Software Quality Automation's TeamTest, QA Partner automatically compensated for time delays and unplanned events that can occur during ***testing. For example, we changed our test script to search for a word we*** ***knew did not exist in our editor application. When QA Partner encountered*** **the unplanned dialog box that appeared as a result of the error, Version** ***3.0 automatically closed the dialog to resume the test and then reported*** ***the error in the test results.***

To make errors easier to spot when the tester analyzes the test ***results, QA Partner highlights the errors in red. By simply double-*** **clicking on the red error text, the tester receives text explaining the** ***exact nature of the problem.***

Reports, analysis, and problem tracking

Like Mercury Interactive, Segue opts to separate some testing features, such as reporting, from the main product by offering them in a ***companion product. This makes SQA's TeamTest the product of choice for*** ***those customers seeking a single integrated test product.***

Although QA Partner does have some reporting capabilities, they are ***spartan. For example, we couldn't customize our reports. In addition,*** ***Version 3.0 provides no charting features.***

Neither QA Partner nor QA Planner provides defect logging or defect ***workflow tracking features.***

Ease of installation and learning

Because QA Partner is straightforward and easy to use, developers and quality-assurance testers should not have any problems learning how to use ***this product. However, if they find that they must use the tutorial that is***

included with Version 3.0, they will find many distracting typos and other ***errors.***

For example, after beginning QA Partner's text-editor examples in the tutorial, we noticed that the sample screens depicted a test script that ***should have been at the end of the tutorial.***

In addition to the tutorial problems, QA Partner uses Electronic Book ***Technologies Inc.'s DynaText instead of Windows' standard help screens.***

Because of this, it took us longer to find the desired information in QA
Partner than it did with other products.
*** We used Segue Software Inc.'s QA Partner 3.0 to create test scripts***
for several applications, including a text editor and Microsoft Corp.'s
Access database applications. We designed our tests to incorporate all
aspects of client/server applications testing, including designing and creating the test, playing back the test, logging defects, and analyzing
and reporting the test results. We modified certain aspects of our
applications, such as positioning form objects, and reran the same test to
perform regress ion analysis and error checking.
*** We tested QA Partner on a 66MHz 486-based Dell Computer Corp.***
Dimension XPS 466V workstation with 16M bytes of RAM and a 512M-byte hard
disk, running under Windows 3.1 and MS-DOS 6.2.

TEST-AUTOMATION TOOLS

*** QA Partner 3.0***
*** WinRunner 3.1***
*** Reviewed Nov. 28, 1994***
*** TeamTest 3.0***
*** Reviewed Nov. 28, 1994***
*** Answer:Testpro 2.5 for Windows***
*** Reviewed Nov. 28, 1994***
*** SEGUE SOFTWARE INC.***
*** MERCURY INTERACTIVE CORP.***
*** SOFTWARE QUALITY AUTOMATION INC.***
*** STERLING SOFTWARE INC.***

PROS

Visual 4Test language very easy to use; excellent record and playback
features; supports 25 platforms.
Powerful script language; can view all object attributes for Visual
Basic applications.
Excellent object-based testing using Visual Basic as the script language; wide array of options makes test playback easy; test results can be graphically displayed in reports and charts; built-in test planning and
defect tracking simplify overall testing cycle.
Tests both Windows and host-based applications with built-in terminal
emulation.

CONS

Planning and reporting features available only in soon-to-be- released
QA Planner; no problem-tracking capabilities.
*** No reporting functions.***
Test-planning process isn't integrated tightly enough with test
development.
Most expensive product tested; difficult to use; no reports or report
writer to format test results.

RECOMMENDATIONS

QA Partner is a great tool for organizations testing applications for multiple platforms, and the Visual 4Test script language reduces the time
required to record and play back tests.
Although WinRunner's powerful script language can be used to control its testing features, TeamTest and QA Partner are easier to use without
sacrificing power in their script languages.
TeamTest is an excellent testing environment for developers and testers of Windows-based client/server applications, particularly those
created using Visual Basic. It is the only product tested that attempted to

cover the entire testing cycle, from planning to analysis of defects.
Answer:Testpro offered the least features for the most money of the
products PC Week Labs looked at. This product would be suited only for
Windows applications that access host data while using one of the supported
terminal emulators.

SPECIAL FEATURES: illustration; table
*** COMPANY NAMES: Segue Software Inc. (Santa Monica, California)--Products***
INDUSTRY CODES/NAMES: CMPT Computers and Office Automation
DESCRIPTORS: Debugging software--Evaluation
PRODUCT/INDUSTRY NAMES: 7372580 Diagnostics Software Pkgs
SIC CODES: 7372 Prepackaged software
*** TRADE NAMES: QA Partner 3.0 (Debugging/testing software)--Evaluation***
FILE SEGMENT: CD File 275

6/9/127 (Item 13 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06701624 SUPPLIER NUMBER: 14369803 (THIS IS THE FULL TEXT)
QA Partner Version 1.0. (Segue Software Inc.'s debugging and testing
software) (Software Review) (one of three evaluations of debugging and testing software for graphical user interfaces in 'Tireless Testers') (Evaluation)
Quinn, Stephen R.; Ware, John C.; Spragens, John
InfoWorld, v15, n36, p78(5)
Sept 6, 1993
DOCUMENT TYPE: Evaluation ISSN: 0199-6649 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 2086 LINE COUNT: 00160

ABSTRACT: Segue Software Inc's QA Partner debugging and testing software
is a very powerful program, although its price is a bit high. QA Partner
costs $1,495 for the single-user, Microsoft Windows or Apple Macintosh
versions. Unix versions cost $4,995 or higher. The software's main
advantage is its portability. Developers may port QA Partner test scripts
from one platform to another without significantly modifying code. The
program uses a scripting language called 4Test, which resembles C. QA
Partner also features object-oriented tagging, in which developers assign
tags to user interface features and then write the tags into their scripts.

The software has a powerful, although unconventional, set of script writing
and editing tools. Its only disadvantage is an unattractive user interface.

TEXT:

What sets QA Partner apart from the other programs in this comparison is that test scripts written for a target application on one platform that QA Partner supports are portable to other platforms running the target
application, with little or no modification of the test scripts. QA Partner

supports Windows, the Macintosh, and several flavors of Unix.

QA Partner's scripting language, 4Test, is similar to C in syntax and
flow of control. Its power is augmented by object-oriented tagging. You can

identify unique user interface elements by tags, which accommodate differences between platforms, and refer to them in a single script that
functions on different platforms. QA Partner will automatically create a
file containing tags for all the high-level user interface elements in a window; for lower level elements, such as dialog windows that open when you make a menu selection, you must open each lower level window manually to capture its tags -- something that can take a considerable amount of work
when you are testing complex target applications. In addition, you will
often have to do some editing of the tag files that QA Partner creates.

One key advantage to this tagging approach is that if a user interface element changes, you only need to change the tag definition in the header
file.

PERFORMANCE: SCRIPT CREATION AND EDITING

QA Partner's 4Test looks very much like C language code, but it lacks
some of the most powerful features of C. Most notably, 4Test does not
support pointers. It does have @ (called the reference operator), which
gives you the ability to indirectly reference either variable names or
function names. This is not a powerful implementation of pointers, however.

4Test is a powerful language nonetheless, with flow-of-control
structures (such as "switch/case" statements) and enumerated data types
that will be familiar to C programmers. There are even parallel, spawn, and

rendezvous statements that facilitate concurrent programming on multiple
machines for networked testing.
*** There are differences between C and 4Test. For example, you can't use***
int -- you must use integer. You can't use x++, either; to increment a
variable you have to type x+=1. These conventions are subtly different, and

you can get used to them, but we were left wishing 4Test had followed the C
syntax more strictly.

QA Partner provides a useful set of editing tools that allow you to
search and replace across multiple test script files. Unfortunately, you
cannot get on-line help while you are in the QA Partner script development
environment.
*** QA Partner is not primarily a record/playback tool. The script***
recorder in QA Partner is designed specifically for its object-oriented
test scripting and is best used as an aid to the programmer, not a
stand-alone script generation tool.

In our testing of the Microsoft Access target applications, we found
no reason to use the recorder at all. We did use the Paste Window
capability when we coded our test scripts. When the Paste Window dialog box

is up, the user can place the mouse cursor over an application or a
specific control in an application and the Paste Window will show the
relevant tags (addresses of controls) for whatever object the mouse cursor
is on. These tags let the user exploit GUI functions to talk directly to
user interface elements in the target application, such as a dialog box's
OK button, using statements such as DialogTagName.OK.Click(). The big
advantage comes when you have 50 script files, each of which clicks on this
OK button in many different statements. If the OK button moves to a
different point on the screen, the tag remains the same. If the name of the

button changes, you just change the tag once, and all 50 files continue to
work.

Using 4Test's GUI functions, you can act on or poll controls in a
target application. 4Test lets you create custom data structures and access

elements in those structures using the "member of operator," also called
the "dot operator." These data structures let the user organize complex
data in a logical and accessible way. Score: Very Good. (187.5 of 250)

PERFORMANCE: SCRIPT DEBUGGING

*** QA Partner supports multiple breakpoints in different files. If you***
want to set a breakpoint at the beginning of a specific function, you
choose the function name from a scrolling list and then drag and drop the
breakpoint within the function. QA Partner takes you to the function text
automatically. This is a very smooth interface.

QA Partner's debugging tools provide the line number and module of
script errors. By pressing F4, you can jump to the error. This feature does

not always work, though.

You can view variables easily in QA Partner, and the approach is very
intuitive. QA Partner has separate floating windows that display local
variables and global variables. QA Partner does not require you to remember

and type in an expression name to get its value while you are in debug
mode. Instead, in the floating windows for global and local variables, the
program gives you a complete list of variables, including their current
values. You can expand and collapse structured data variables in outliner
fashion. QA Partner also has an expression evaluator to allow the user to
test functions on the fly, from simple arithmetic expressions to calling
user-generated functions.

QA Partner's programming environment gave us the tools we needed to
debug code easily, and all the tools we needed were easily accessible.
Score: Very Good. (93.75 of 125)

PERFORMANCE: RUNNING A SCRIPT

QA Partner is adept at running a script and collecting useful and
readable information about your application. QA Partner was able to
successfully process 3,000 transactions during our endurance test. When we
ran our test against nonfatal errors, QA Partner correctly identified and
logged the problems. When we ran our alternative script, QA Partner wasn't
able to trap the General Protection Fault (GPF); it simply hung when the
GPF occurred.

We were able to do most of our testing with QA Partner without
programming in any delays to synchronize the test script with our
application -- one of QA Partner's strong points. In our tests of the
Access applications, we needed to add synchronization code only to cover
instances where dialogs appeared intermittently, and the length of time
the box remained on the screen varied.

QA Partner handles exceptions automatically and logs "pass" or "fail"
information for individual test cases. In QA Partner, the keyword "
****** testcase ***" can be used to identify modules of code. When you
specify***
that a function is a test case, QA Partner logs an error message in the
results file and the flow of control jumps back to the routine that called
***the *** testcase *** function. This means you do not have to write your
own***
test case handlers. The one missing component is an automatic mechanism for

trapping and handling GPFs, so you will have to write your own GPF traps
and handlers.

With use of the testcase keyword and a bit of additional code,
you should be able to run a test suite overnight without worrying that it
will break as soon as you stop watching it, but you will have to do some
serious coding in 4Test if you need to trap GPFs and resume testing
afterward.
*** QA Partner automatically generates useful, legible results logs. You***
can read the results files in the script development environment, and they
are color coded so you can scan them quickly to find problem areas. The
results of your test are presented in an outliner format that lets you
expand or collapse sections of the output. This format was especially
helpful when we needed to review the results of a large number of test
cases. We were able to move quickly to the important parts of the file. QA
Partner lets you include print statements in the test case code to write
out crucial information, and you can use the Raise statement to force test
case failures. Segue says QA Partner 1.1 will support the creation of
secondary log files in ASCII format. These secondary log files would be
useful if you wanted files formatted specifically for import into a bug
reporting and tracking application.
*** QA Partner does not support precompiled headers or scripts. This is a***
deficiency you will not have trouble with until you start developing long,
complicated test scripts. At that point, it will slow you down.

QA Partner supports user-generated Suite files to run a number of
scripts without requiring the programming of file list processing
functions. Score: Very Good. (168.75 of 225)

PERFORMANCE: OTHER FEATURES

The advantages of QA Partner's cross-platform capabilities were

obvious during our recent Macintosh vs. PC comparison (August 2, page 70).
We created a FileMaker Pro test on the PC using QA Partner. With very
little work -- mainly translating window tags and hotkey combinations -- we
were able to port the test to the Macintosh. The different versions of QA
Partner are so similar that they even use the same manual.

For testing over a network, QA Partner requires a NetBIOS-based
network protocol. QA Partner lets you test multiple target applications,
each instance of the application running on its own target machine. This is

accomplished by letting you programmatically control multiple target
machines from a single "test server" machine across a network.

QA Partner has a functional, but not particularly attractive, user
interface designed strictly as a test code programming environment.
*** Segue says this will be improved in Version 1.1. Score: Satisfactory.***
(50 of 100)

DOCUMENTATION

QA Partner's manuals are quite useful as reference works, but they do
not provide a tutorial for new users. The loose-leaf manuals are well
organized, giving you easy access to the command information you need with
a minimum of effort. The manuals are austere, with few screen shots. The
code examples in the reference section are complete, but we did find some
errors in the example code. Segue says it is aware of the errors and has
corrected them for Version 1.1.

The manuals make some attempt to bring new users up to speed, but
there is a long road between not knowing anything about QA Partner and
making full use of its object-oriented programming paradigm. Unfortunately,

reading the documentation is not a good way for a novice to learn how to
use the program. Score: Satisfactory. (37.5 of 75)

SUPPORT POLICIES

Segue offers 90 days of free telephone support, Monday through Friday
from 8:30 a.m. to 12:30 p.m. and 1:30 p.m. to 6 p.m. Eastern time, and
support via fax and the Internet. Custom corporate support plans are
available. QA Partner comes with a 90-day money-back guarantee. Score: Very

Good. (37.5 of 50)

TECHNICAL SUPPORT

*** Segue's response timeliness was erratic. Sometimes we got right***
through, sometimes we left messages and received faxes in response, and
once we waited overnight for a callback. Technical support engineers were
always extremely knowledgeable and helpful. Score: Satisfactory. (25 of 50)

VALUE

The full Windows and Macintosh development environments are each
priced at $1,495 for a single user. Discounts are available for 10 or more
copies. Ten copies, for example, cost $13,455; 25 copies cost $31,395.
Drivers, which run scripts but do not include development tools, are $750.
Site licenses are available. Prices for Unix versions start at $4,995 for
the development environment. Segue will provide software for a 30-day
evaluation at no charge.

QA Partner is a little pricey; full- fledged C or C++ development
environments don't cost as much. Nevertheless, QA Partner clearly has been
designed from the ground up with a solid understanding of automated test
theory. Features such as the capability to raise exceptions, automatic test

case results logging, and cross-platform capabilities give QA Partner an
edge, especially if you are doing cross-platform testing. Score: Very Good.

(93.75 of 125)
*** Company: Segue Software, in Newton Centre, Mass., can be reached at***
(617) 969-3771.

SPECIAL FEATURES: illustration; photograph
*** COMPANY NAMES: Segue Software Inc. (Santa Monica, California)--Products***
INDUSTRY CODES/NAMES: CMPT Computers and Office Automation
SIC CODES: 7372 Prepackaged software
TRADE NAMES: QA Partner (Debugging/testing software)--Evaluation
OPERATING PLATFORM: MS Windows; Apple Macintosh; UNIX
FILE SEGMENT: CD File 275

6/9/128 (Item 14 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06701622 SUPPLIER NUMBER: 14369773 (THIS IS THE FULL TEXT)
Tireless testers: automated tools can help iron out the kinks in your
*** custom GUI applications. (debugging and testing software for use with***
graphical user interfaces) (includes related articles on testing
methodology, on executive summary and on summary) (Software Review)
(overview of three evaluations of debugging and testing software for use
with graphical user interfaces) (Evaluation)
Quinn, Stephen R.; Ware, John C.; Spragens, John
InfoWorld, v15, n36, p72(8)
Sept 6, 1993
DOCUMENT TYPE: Evaluation ISSN: 0199-6649 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 4881 LINE COUNT: 00388

ABSTRACT: Three debugging and testing software programs for use with
graphical user interfaces (GUIs) are reviewed. Products include Microsoft
Corp's $499 Microsoft Test, Segue Software Inc's $1,495 QA Partner and
Software Quality Automation Inc's $1,495 SQA TeamTest 2.2. QA Partner is
recommended because of its cross-platform flexibility. QA Partner is well
synchronized with tested applications, although its error trapping
capabilities are somewhat limited. Microsoft Test receives the next-highest

rating because it includes Smart Events, which let developers add events to
applications, simulating user input. However, the program does not
automatically keep a log. SQA TeamTest is not as useful as the other two
programs, since it has many quirks and does not include important features
such as support for networked testing.

TEXT:

Developing applications that work right the first time has never been
an easy task, and graphical user interfaces (GUIs) such as Windows and OS/2
have introduced new complexities. How can you make sure the critical
application you deliver to your corporate "customers" is bug free?
*** You have several traditional alternatives. You can have your***
programmers run tests as they debug the applications, then collect bug
reports from your end-users. This is generally considered the least
satisfactory approach to software testing. You can recruit a team of people

to sit at keyboards and put the applications through their paces. This,
along with beta site input, constitutes software quality assurance in some
software development companies, but it is expensive to hire enough people
for long enough to run a thorough series of tests. Another possibility is
using your development tools' macro or scripting capabilities to develop
tests.

If you need to produce bug-free IS applications, none of these
alternatives is a complete answer. Fortunately, you have another option --
one that gives corporate software developers many of the testing
capabilities that developers of shrink-wrapped software have enjoyed for

years. Commercial software houses frequently build their own automated
testing tools. Now, there are similar tools that are coming onto the market

at prices that make them practical for IS teams to use.
These programs can automate tests for GUI-based applications,
simulating the input from a human user and recording results. In some
cases, automation can exceed what a human could reasonably do.
For example, automated test tools can try every permutation that is possible in a feature set, exactly reproduce tests many times, or test a
program 24 hours a day throughout the program's development cycle.
In this comparison, we look at the capabilities of three automated
test tools: Microsoft Test, Version 2.0 from Microsoft Corp. (originally
developed for internal use at Microsoft); QA Partner, Version 1.0 from
Segue Software Inc.; and SQA TeamTest, Version 2.2 from Software Quality
Automation Inc. These were the three testing tools that drew most interest
in a recent survey of InfoWorld readers, but there is a growing list of
contenders in the market.
The field includes the Automated Testing Facility (for Windows) from
Softbridge Inc., AutoTester from AutoTester Inc., ProKey for Windows and
QuicKeys (for Macintosh) from CE Software Inc., Sterling TestPro from
Sterling Software, Virtual User (for Macintosh) from Apple Computer Inc.,
VistaReplay (for X Windows) from Veritas Software, and WinRunner (for
Windows) and XRunner (for X Windows) from Mercury Interactive Corp.
At InfoWorld, we have used some of these automation tools in the
course of our own benchmark testing. We have used Microsoft Test to drive
parts of InfoWorld test suites since last year, and we used QA Partner to feed commands and data to our target applications in our August 16 (page
65) comparison of Windows programmable databases.
At InfoWorld, we used the test tools primarily to standardize input for several target programs -- feeding the same set of commands to functionally identical database applications developed with four different
database programs, for instance -- and to help us collect benchmark data.
That is, we used the tools primarily for their automation features. The
tools also offer testing features, such as trapping errors found in the
code during the automation. In this comparison, we explore both the
automation and the testing capabilities of the products.
*** These test tools can be especially effective for regression testing.***
Regression testing verifies that the target application has not "regressed" -- that is, that a bug you have already identified and fixed has not reappeared -- and checks to be sure that no functions that worked in a
previous version of the application have broken in a revised version. These

tools, however, do not provide the answers to all of an IS department's
quality assurance problems. It is very difficult, for example, to write
automated test scripts to find new bugs. Beta testers are not an endangered

species.
*** It will take time for a user to get up to speed with these test tools.***

If the script programmer is comfortable with Basic (in the case of Microsoft Test and SQA TeamTest) or C (in the case of QA Partner), the
learning curve will be shorter. Even users who have appropriate programming

experience should count on a few weeks to really become productive with one
of these programs. There are many new concepts to learn, and users must
explore and understand the commands that directly access the graphical user
interface of the target application.
Two of the three vendors in this comparison -- SQA and Segue -- offer
training. Microsoft University does not currently offer any courses on
Microsoft Test.
Although the initial investment of time and effort is significant,
automated test tools can provide a handsome return in several ways.

Effective automation will provide you with quick, reproducible
validation of your applications after yo u make minor changes. It will also

provide you with a test method that is always available, works nights and
weekends, and can be maintained easily. In many cases, automated test tools

can make more thorough testing practical and, potentially, speed
development of quality applications .

RELATED ARTICLE: Summary

PERFORMANCE: SCRIPT CREATION AND EDITING

Microsoft Test's script recorder does the job, recording simple routines in functional test scripts and capturing information for inclusion
in longer scripts. SQA TeamTest's recording capabilities are more flexible,

but we sometimes encountered problems running the scripts as recorded. The
TeamTest scripts were very legible and easy to edit. QA Partner's recording

capabilities are focused on aiding in manual scripting, rather than on
creating scripts that will run as recorded.

SQA TeamTest, Microsoft Test, and QA Partner all provide complete,
capable languages. We preferred the C-like constructs in QA Partner's 4 **Test language, but you should decide for yourself whether you would be more comfortable with a C-based language or the Basic-based language of**
Microsoft's TestBasic and the Visual Basic used with SQA TeamTest.

QA Partner provides the largest dictionary of automated test commands,
with more than 200 constructs designed for automated testing. Through use **of its Dynamic Link Libraries, Microsoft Test provides more than 150**
automation-specific commands. SQA TeamTest trails, with about 70 Test
Procedure Commands.

Both Microsoft Test and SQA TeamTest (via Visual Basic) have editors with some attractive capabilities, including group tabbing, good search and
replace, and context-sensitive keyword colorization. The colorization **feature is very useful, especially for someone who is learning a language,**
and we missed it in QA Partner.
*** For the easiest editing, choose Microsoft Test. For the best***
automation-specific scripting capabilities, choose QA Partner. SQA **TeamTest's editing is just as easy as editing in Microsoft Test, except for**
difficulties in the coordination between Visual Basic and TeamTest.

PERFORMANCE: SCRIPT DEBUGGING

A complex test script is as difficult to debug as an application -- sometimes more difficult, because you have to deal with inherent problems in the way you have coded the script and also with any instability or other
problems that may show up in the target application. All three products
provided useful, capable debugging tools.

We really appreciated the accessible interface of QA Partner when
stepping through scripts and setting breakpoints. Being able to choose a **function in your test script source and then drag and drop the breakpoint**
within the function made adding breakpoints quick and easy. Microsoft Test **and SQA Robot (through Visual Basic) provide full-featured breakpoint**
capabilities. The View Breakpoints dialog in Microsoft Test is useful for
managing multiple breakpoints in multiple files. You may run into **difficulties dealing with breakpoints in SQA TeamTest, primarily because of**
the interface between TeamTest and Visual Basic. Once you figure out how to

do it, you can get good functionality.

All three applications provided capable tools for getting to and
fixing errors in the syntax of our scripts. We could always get to an
offending statement quickly.

You can view variables easily in QA Partner with separate floating
windows that display local variables and global variables. This capability **to list all local and global variables automatically in separate windows is a unique and very useful feature that neither Microsoft Test nor SQA**

TeamTest provides.

One particularly convenient feature that all three products support is displaying data structures using an outlining metaphor, where the complex variable's name can be expanded -- to show the values of all elements in
the structure -- and collapsed back into just the name.

None of the products was completely free of flaws in its debugging
capabilities. QA Partner had occasional problems jumping to errors.
Microsoft's Watch window could use work, and we spent a fair amount of our SQA TeamTest development time restarting the application when it was left
in an uncertain state during debugging. SQA provides a work-around for this

problem, but we found it cumbersome.

PERFORMANCE: RUNNING A SCRIPT

*** This is one area where QA Partner really excels. QA Partner is adept***
at running scripts and collecting useful and readable information about
your application. QA Partner supports a test suite file type that allows
you to run multiple test files automatically. All results are logged
automatically.

Once we worked through a problem with the identification of the "Main" module in Microsoft Test, we had no problems quickly running our test
scripts.

The first time you run an SQA TeamTest script, you end up waiting for SQA Robot to automatically start Visual Basic, which then loads several
files before executing the script.

The synchronization capabilities of QA Partner make it a lot simpler
to write scripts that work right. Once you get the hang of it in Microsoft
Test or SQA TeamTest, you can usually identify when to use pauses in your scripts, but having the test tool provide these functions automatically
leaves you with one less thing to worry about. Effective synchronization in

Microsoft Test and SQA TeamTest requires more coding.

QA Partner has the best system for handling exceptions or failures in
the target application, except for General Protection Faults (GPFs). SQA
TeamTest has a great system for handling GPFs, which worked as promised the very first time we implemented a script that would crash the target
application. Microsoft Test provides no useful automatic exception
handling, but you can manually code in traps and exception handling
capabilities. Any of the products will reliably run overnight, but a GPF
will stop all the products dead in their tracks unless you provide
additional code to handle such events.

QA Partner provides outstanding test logging capabilities, with "
testcase" **and "raise exception" capabilities that make the creation**
of good test logs almost automatic. You can read the results files in the
script development environment, and they are color coded so you can scan
them quickly to find problem areas. The results of your tests are presented

in an outliner format that lets you expand or collapse sections of the
output. This format was especially helpful when we needed to review the
results of a large number of test cases. We were able to move quickly to
the important parts of the file. QA Partner lets you include print
statements in the test case code to write out crucial information, and you can use the Raise statement to force test case failures (which are
highlighted in red in the outliner results file output).

Microsoft Test and SQA Robot both offer log files in the form of ASCII
text. These files are as complex as the user wants to make them. SQA Robot
creates some output to logs automatically and is particularly detailed in
logging GPFs. Microsoft Test was disappointing, with no logging
capabilities other than standard file I/O.

PERFORMANCE: OTHER FEATURES

The networked testing capabilities of Microsoft Test are competitive with those of QA Partner, but in Microsoft Test you have to write those
functions into your code. SQA TeamTest does not provide for networked

testing. Both Microsoft Test and QA Partner require a NetBIOS-based network

to drive test automation on multiple target machines from a single test
server.

The cross-platform capabilities of QA Partner are very important to developers who are writing applications to run in more than one environment or who might want to automate tests on more than one platform in the
future. Microsoft Test and SQA TeamTest do not support cross-platform
portability.

The user interface of Microsoft Test is polished compared to SQA
TeamTest and QA Partner. Microsoft Test's interface has improved markedly
since its previous release. Segue has promised that the user interface of
QA Partner, now in Release 1.0, will be improved in the future. SQA
TeamTest is already in release 2.2, but there still is plenty of room for
improvement.

DOCUMENTATION

SQA TeamTest provided the best introductory information on automated testing, including a cleverly devised scenario with three builds of a
target application in various states. The manual discusses testing strategy

in detail. Microsoft Test provided some good information. Segue,
unfortunately, provided no real hand- holding for someone not experienced
with automation tools and the goals and design of automated testing.

QA Partner had the best sample code for inserting pauses in a test
script, with TeamTest a distant third.

QA Partner's loose-leaf manual is easier to use than the bound manuals
of SQA TeamTest and Microsoft Test. Microsoft Test's documentation contains

good tutorial information and reasonable reference detail. SQA's
documentation provides the strongest tutorial and the weakest reference
material. Segue's documentation provides the weakest tutorial but very
strong reference material.

The on-line help systems of Microsoft Test and of the Visual Basic you
must use with SQA TeamTest are both first-rate.

SUPPORT POLICIES

Microsoft Test is the only program in this comparison with unlimited
free telephone support. Segue provides 90 days for QA Partner; Software
Quality Automation provides 30 days for SQA TeamTest. Microsoft and Segue
offer 90-day money-back guarantees; there is none for TeamTest.

TECHNICAL SUPPORT

Segue's support was a little erratic, and we didn't like always having to wait for a callback from Microsoft, but technical support
representatives from all three companies were knowledgeable and helpful.

VALUE

Each product has some capabilities that may make it the right tool for
you. If you are developing an application to run on more than one platform,

QA Partner is the only program in this group that addresses your concerns.
If the price of TeamTest or QA Partner is beyond your budget, Microsoft
Test will work fine for automating tests on most Windows applications. SQA
TeamTest provides an integrated environment that may be valuable to some users and favors recording over writing code; it also demands patience with
a clunky user interface.

RELATED ARTICLE: HOW WE TEST GUI TEST TOOLS

Order entry application serves as basis for GUI test

To evaluate these graphical user interface (GUI) tools, we used a simplified model of the process an IS department might go through in
developing, then revising, an order entry application. Using the database
application we developed for our comparison of Windows programmable databases (August 16, page 65), we mimicked the problems involved in
testing an application's function and reliability. We also considered how
the test tools check a revised application to be sure it functions and

looks the same as the previous version. We evaluated how thoroughly the
testing tools could put the application through its paces; we also noted
how smoothly each tool automated the testing process.

We initially intended to use the order entry application we developed
in Borland International Inc.'s Paradox for Windows to avoid any bias that
might be introduced by using a test tool from one company to test an
application developed in another product from the same company.
Unfortunately, Microsoft Test and SQA TeamTest do not work with Paradox for Windows, so we substituted the application we had developed in Microsoft
Corp.'s Access 1.0. TeamTest also had some difficulties with Access. At one

point, TeamTest paused while the application printed a file to disk and
never awoke from its nap. Software Quality Automation says this problem has

been corrected in the current maintenance release, Version 2.2D.

We set a complex range of tasks for these test tools -- requiring them, for example, to deal with a number of interface elements that are not
standard Windows controls. Nevertheless, time constraints prevented us from

exercising all the products' features. We did not test the tools'
capabilities for driving and monitoring graphics programs or multimedia programs, and we did not include any Object Linking and Embedding (OLE) and
Dynamic Data Exchange (DDE) functions in our test application. Nor did we
formally test the products' network capabilities.
*** The heart of each of these testing tools is a scripting language. In***
some cases, you can develop scripts using recorders, which are a bit like
very elaborate macro recorders. Often you will need (or prefer) to write
the scripts directly. We looked at both approaches and evaluated the
testing tools' scripting capabilities much as we would those of any
programming language.

We developed our test scripts and ran our tests on a 33-MHz 80486 machine -- a Gateway 2000 4DX-33 -- with 8MB of RAM and a 340MB hard drive,
running MS-DOS 6.0 and Windows 3.1.

Script Creation and Editing:

Most of the time you spend working with an automated test tool, you
will be creating and editing test scripts. The editing tools must be
robust, they must give you the results you expect, and they must be
convenient to use.

To test the scripts we were creating and editing, we first changed an
existing application. Every time a program is modified -- to solve old
problems or add new features -- there's a danger new bugs will appear. We
took a smoothly functioning program and introduced several changes similar
to those that might be made as real-world applications are updated. We
added a new item to a pull-down menu, changed a dialog box title, changed
buttons in two dialog boxes, and altered the tab order in a dialog box. To
check out test tools' capabilities for trapping General Protection Faults (GPFs), we wrote a routine that executed a query -- one we knew would cause
trouble -- from the Access application.

We developed test scripts that would exercise a wide range of the functions available in our test application, watching for errors and other
unexpected behavior. Our scripts also checked the user interface for
functional or cosmetic changes that might have crept in as the application
was updated. As they exercised the target application, the scripts made
sure we were capturing information about the application's performance in a
results file.

To earn a satisfactory score, a testing tool had to provide a set of functions adequate to exercise a wide range of features in applications
under test. The testing tool also had to have an editor with a basic range
of features, such as cutting, copying, pasting, and finding and replacing.
We expected script recorders to generate scripts that would work without modification and would drive our application through the routines we
planned to test. We also required that the recorders produce scripts with

enough formatting to allow us to read them easily so that we could track
what the scripts were doing and edit the scripts if necessary.
*** Test tools that provided greater functionality earned higher scores.***
In the script editor, we looked for such additional features as complex
text formatting, automatic indentation in the script, and easy access to a
list of available functions. A find-and-replace feature that worked across
multiple files also earned extra points. We gave higher scores for
recorders that could handle complex synchronization, ensuring that the
script would not "run ahead" of the target application and insert text or
issue commands before the application was ready for them.

Script Debugging:

Some potential problems in a test script show themselves as you write
the script. Other problems show up only after you begin running the script
to drive your target application. A testing tool should help the developer
track down both kinds of errors.

We tested the products' debugging capabilities by running the scripts
we had developed, tracing through the code, and debugging as needed. We
also introduced some deliberate errors (such as endless loops) into our
scripts.

To earn a satisfactory score, a program had to let us set flags, step
through code line by line, and step to the next breakpoint. The program had

to let us recover gracefully from script errors, break out of loops, and
identify the locations of our errors. We also had to be able to find the
value of any variable or subset of variables during trace and execution.

Higher scores went to programs that let us add breakpoints
interactively, step through multiple modules with breakpoints, and step
over and into function and routine calls. Jumping to the editor at the line

causing an error was a plus; so was jumping forward to the next suspect
line number and providing descriptive error messages. Programs that allowed

us to evaluate expressions on the fly, monitor variable values in a
configurable window, set alerts when variable values strayed outside
defined ranges, and list the order of all functions and procedures that had
been called also earned higher scores.

Running A Script:

The proof of a script is in the running, so we tested our scripts
against three versions of our target database -- the stable version, the
version with a variety of changes in function and appearance, and the
version that produced a GPF. As part of our tests, we used each test tool
to drive our stable application through 3,000 cycles -- enough to keep it
running about 24 hours -- to see whether the tool would perform reliably
during a long session of unattended testing. We also watched for successful

synchronization between driver and application, skillful handling of errors
and other unexpected events, and useful logging of test results.

For a satisfactory score, we expected a test tool to wait for the
application to process events such as keystrokes and mouse clicks without
getting ahead of the application. Programs that could cope readily with
nonstandard Windows controls received higher marks. We expected a program
to log the GPF in the fatally flawed version of our test application.
Programs that provided automatic tools to trap the GPF, rather than
requiring us to code this function by hand, earned extra points. We also
gave extra credit if the program could continue to execute the test script
after encountering the GPF -- for example, log test results, close the
application, restart the application, and begin running the next test case.

A satisfactory program had to run the test script unattended, recording
problems and continuing to run even when there were errors in the target
application. A program could earn higher marks for sounding audible alerts
when problems cropped up. A satisfactory program had to log pass or fail

information on specified tests and allow us to write code that inserts text
and variable values into the log. We gave higher scores for such features
as time-stamped errors and the inclusion of system information and Windows
resource information in error reports.

Other Features:

*** These products offer more features than we were able to test directly.***

In this section, we took a brief look at significant features that we did
not test. We paid particular attention to capabilities for testing on a
network and cross-platform testing.

Documentation:

We expected each product's documentation to provide complete and
reasonably accessible information on how to use the program. Because test
automation is a relatively new software category, we looked for some
training and explanation of the concepts of automated testing. We gave
higher scores for documentation that was particularly successful at
explaining the most effective ways of using the product.

The quality of the language reference material is a key to successful
use of automation products. In particular, we noted the way each vendor
explained a standard function that is essential for good automated testing:
the capability of pausing for a specified length of time before continuing.

We looked for a complete description and an example with enough context to
really help us get the function to work. Clear writing, helpful examples,
and accessible organization throughout the documentation also contributed
to higher scores.

Support:

We divided support into two parts: support policies and technical
support. In scoring support policies, we awarded a satisfactory score for
unlimited free support from the vendor. We added points for support via fax

and electronic bulletin boards, money-back guarantees, extended hours, a
toll-free line, and custom-tailored corporate support plans. We subtracted
points when vendors provided limited or no support.

We based technical support scores on the quality of service we
received in multiple anonymous calls to the vendor and the availability of
knowledgeable technicians. We awarded bonuses for extra helpfulness and
subtracted points for incorrect answers, unreturned calls, and long waits
on hold.

Value:

*** Value is a balance of performance, features, and price. The better the***

price-performance mix, the better the value of the program. An excellent
rating required top performance at a reasonable price. When the program
under test required another program to provide essential capabilities, we
considered the total price of all the programs in the package.

RELATED ARTICLE: Executive summary

Automated software test tools, once the province of software
development companies with the in-house staff to write their own programs,
are emerging on the commercial market at prices that may make them
attractive to corporate IS developers. The three products we tested in this

comparison offer major advantages for many kinds of testing, but their
limitations make it clear that this is still an immature software category.

QA Partner sets itself apart from Microsoft Test and SQA TeamTest by
offering cross-platform capabilities. QA Partner scripts can be ported,
with little modification, from Windows to Macintosh and several flavors of
Unix. If you are familiar with C, you will find yourself at home in QA
Partner's 4Test scripting language. 4Test is the main tool for producing
tests in QA Partner. The program's recording features are intended for
capturing the routines to accomplish specific tasks, not as a substitute

for coding scripts. QA Partner synchronized its commands with the target
application well and readily collected appropriate information in a log file, but it did not provide the functionality to trap the General
Protection Fault (GPF) in InfoWorld tests.

Microsoft Test, with its Visual Basic-like TestBasic scripting language, draws much of its power from the "Smart Events" included in the
Dynamic Link Libraries (DLLs) that ship with the program. It offers some
recording features, but logging results and many other essential functions
-- including traps for GPFs -- must be coded by hand. Once you have
completed your scripts, you can compile the code for distribution as .EXE
files at no extra fee. Although we would like to see more functions
implemented automatically in Microsoft Test, the program is a useful tool for automating tests, and it is the least expensive product in this
comparison.

SQA TeamTest provides an integrated testing environment, adding a Test
Repository that lets you log and track test results. TeamTest uses its
recorder -- which provides for object-oriented recording -- as the primary method for generating scripts, and it relies heavily on bit-map comparisons
for verification. TeamTest adds its own Test Procedure Commands to the
functions provided in Microsoft's Visual Basic, which is required to run
TeamTest. It also allows you to access functions provided in other vendors'

DLLs, even the ones that come with Microsoft Test. TeamTest provided the
best means of trapping GPFs of any product in the comparison, but overall
it lagged behind Microsoft Test and QA Partner.

SCORES

*** QA Partner, Version 1.0 6.9***

*** Microsoft Test, Version 2.0 6.6***

*** SQA TeamTest, Version 2.2 5.3***

SPECIAL FEATURES: illustration; table
*** COMPANY NAMES: Microsoft Corp.--Products; Segue Software Inc. (Santa***
*** Monica, California)--Products; Software Quality Automation Inc.--Products***

INDUSTRY CODES/NAMES: CMPT Computers and Office Automation
DESCRIPTORS: Debugging software--Evaluation
SIC CODES: 7372 Prepackaged software; 3577 Computer peripheral equipment, not elsewhere classified
TICKER SYMBOLS: MSFT
*** TRADE NAMES: Microsoft Test 2.0 (Debugging/testing software)--Evaluation;***

*** QA Partner (Debugging/testing software)--Evaluation; SQA TeamTest 2.2***
(Debugging/testing software)--Evaluation
OPERATING PLATFORM: MS Windows
FILE SEGMENT: CD File 275

6/9/129 (Item 15 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05769942 SUPPLIER NUMBER: 11744314 (THIS IS THE FULL TEXT)
Quality tools for quality software. (overview of software-quality tools)
Snell, Ned
Datamation, v38, n1, p53(2)
Jan 1, 1992
ISSN: 1062-8363 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1445 LINE COUNT: 00117

ABSTRACT: There is a wide range of strategies, all equally good, for
assuring software quality. Computer-aided software engineering (CASE) tools

can build quality into the original design, leaving little need for post-programming testing; at the other extreme, developers can perform
on-line testing and debugging of finished source code. At Plymouth,
MN-based ITT Life Insurance Corp, programmers use Compuware Corp's dBug-Aid debugger, the Abend-Aid fault-diagnosis tool and the Playback simulation
tool. Once developers have mastered basic quality-assurance tools such as
these, they can turn to so-called 'glass box' testing tools, which analyze code for elegance and efficiency of design and conformance to in-house
standards. The most sophisticated tools, called integrated test systems,
inject quality control procedures into the development process from the
beginning.

TEXT:

Hilary Reilly, vice president of systems technology and planning for
the National Association of Securities Dealers (NASD) in Washington, D.C.,
says NASD must produce only the highest quality software to support its
stock quote servcie and other systems. Denise Hatton, senior systems
programmer for ITT Life Insurance Corp. in Plymouth, Minn., says the same
thing about the insurance applications produced in her shop.

So how do they differ? Reilly's shop uses computer-aided software engineering (CASE) tools to build client/server applications so carefully designed that they will someday--Reilly hopes--demand little
post-programming testing. Hatton's shop is using time-proven testing and
debugging tools to verify the quality of each and every COBOL-coded
application after programming. She admits the applications are not built
with any single and deliberate quality assurance strategy. "We do not have
a real good quality assurance program," Hatton says. "But it's not caused
us any troubles."

Reilly's and Hatton's different approaches to the same goal show that maintaining a viable and lasting level of software quality is not a simple
matter of choosing the single best set of development practices. A wide
range of differing quality strategies can work just as well: basic on-line testing and debugging of finished source code, top-to-bottom unit and requirements testing throughout the development cycle or bullte-proof CASE
development procedures that build quality into the original design.

Here's a bottom-to-top look at some of the tools available to developers charged with the task of deciding which quality development
process is best for their shops.
*** At ITT Life, Hatton et al are using Compuware Corp.'s dBug-Aid, an***
IBM mainframe-based interactive source-level debugger. The product scans
source code on screen, stopping wherever it locates an actual coding error
or other potential problem, such as an unresolved subroutine call. The user

can edit the offending code to fix the error from within the debugger and
then continue debugging.

From Debugging To The Glass Box

ITT also uses other Compuwater tools to assure quality is maintained
after a tested application is put into production. These include Abend-aid,

a software fault diagnosis tool that intercepts system error messages, pinpoints the cause and recommends corrective action; and Playback, a simulation tool that tests program performance under phantom production
scenarios. Playback records user activity and saves it in the form of an
editable script. Software testers can edit and expand the script and
repeatedly run the software through its paces, hoping to reveal the soft
spots before users crash through them.

Simulation tools also are useful for regression testing, a statistical method of checking a program for performance and quality after
modifications. A newly changed program can be run through the same

simulation the original program endured. The simulator reportrs any
differences in behavior or performance, helping the programmer prevent
inadvertent boo-boos from sneaking in with the updates.

But once developers have mastered these three basics of application
quality control--debugging, fault diagnosis and simulation--they can also
turn to a new, more sophisticated set of quality-testing and control tools.

These so-called "glass box" testing tools peer inside the code. They
analyze code not just for base performance or bugs but also for conformance
to in-house development standards or even just for sheer elegance and
efficiency of design.
Development project teams at GTE Data Services Inc. in Temple
Terrace, Fla. use Eden Systems Corp.'s Q/Auditor to analyze their COBOL
applications and to ensure conformance to standards, says Tracy Lambert,
senior administrator of project quality assurance. "We also use it as part
of a risk assessment process," she says. "We look at the complexity of a
program and the complexity of the paragraphs and test cases. And we analyze

module complexity to make sure that adequate inspection time is applied to
the more complex programs."

When GTE testers run code through Q/Auditor (which is available for
PCs and mainframe systems), the test program applies any of 450 standard
quality measurements--"metrics" in testing parlance--to the COBOL programs.

It then generates a report describing steps that programmers can take to
reduce complexity and size, or to ease future maintainance and portability.

The results can even be used as a road map for another Eden product,
Q/Artisan, which can reengineer and rewrite COBOL applications in a
cleaner, leaner, better documented form.

Automated Suites

Eden's glass box tools may be high powered and sophisticated, but
some users are turning to an even more sophisticated set of testing tools.
These full test managers, or integrated test systems, may constitute the
most practical approach to quality software, says Robin Goldsmith of
consulting firm GoPro Management Inc. Although full test managers 'require
an enormous amount of up-front effort and a lot of attention to keeping
them current," says Goldsmith, "that is the direction the industry is
going."

Unlike debuggers, simulators and code analyzers, which merely test
finished programs, full test managers inject quality assurance procedures
into the development process early on, while also analyzing models and
helping developers plan the testing strategy.
Sandia National Laboratories in Albuquerque, N.M., uses the Software
TestWorks integrated full test toolset from Software Research Inc.
including TCAT, a test coverate analysis tool. Coverage analysis breaks
down program code or precode models to determine what tests need to be
performed to adequately cover all the bases for a given application or
design. It then analyzes proposed test cases to determine whether they'll
do the whole job.

"It tells us how good our test cases were," explains Darl Patrick,
senior member of the technical staff at Sandia. "And since we do a lot of
the requirements-based testing, when we get through, if we have a high
percentage of coverage, we have a lot of confidence that the code that's
there really does the job that's intended."

The TestWorks set--available for PCs, a variety of workstation types
and mainframe systems--supports most common programming languages. In
addition to coverage analysis, the set generates data to be used for test
routines, runs regression tests and even handles simulation and software
usability testing. For example, the TestWorks simulation component can
record and graphically display mouse movements, and it can repeat them as
part of a test.

*** Sequel Corp.'s Pro Term test manager toolset can also perform***
regression, simulation, integration, performance and a flock of other
tests. It can be used to test either in batch mode or with on-line
applications, and it can be used to test all components of a typical MVS
environment, such as the operating system, teleprocessing monitors an
database software.
*** McCabe & Associates Inc. also markets a set of test management tools***
that users can purchae as separate products that interface at logical
points. McCabe tools perform complexity analysis, requirements testing and
planning, and test coverage analysis for a variety of languages and
workstation environments. Like Software Research's tools, the McCabe tools
exploit graphical environments to make some test activities more easily
understandable. For example, McCabe's Analysis Of Complexity Tool (ACT) can

display a graphical representation of a program's structure on a split
screen next to an annotated source code listing.

Segue To CASE

McCabe offers software bridges from its Start structured testing the
requirements tool to several CASE structured analysis tools, reaching the
continuum boundary between test tools and CASE. Sharing that boundary is
Cadre Technologies Inc.'s Teamwork/ TestCase ***, a UNIX-based
front-end***
CASE tool that automates test case generation--the only CASE product to do
so, says Cadre.

The McCabe and Cadre products may be harbingers of the inevitable
integration of automated-testing tools and CASE development tools. But
whether CASE marries automated testing or displaces it, the pace of the
move to CASE suggests that software testing products at all levels will
continue to find buyers for a few years yet.

While ITT's Hatton continues to serve up well-tested COBOL to her
users, NASD's Reilly--moving full-throttle toward CASE--admits she really
doesn't know yetwhether the effort will reduce testing requirements.
"That's the 64-million-dollar question," says Reilly. Literally.

Ned Snell is owner of Manual Dexterity, an Indianapolis-based
freelance writing firm specializing in information management issues.

SPECIAL FEATURES: illustration; photograph; table
INDUSTRY CODES/NAMES: CMPT Computers and Office Automation
DESCRIPTORS: Program development software--Usage; Computer-aided software
engineering--Usage
FILE SEGMENT: CD File 275

6/9/130 (Item 16 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05580314 SUPPLIER NUMBER: 11761506 (THIS IS THE FULL TEXT)
Counting the cost of CASE. (computer-aided software engineering) (Software:

Tools)
Campbell, Richard
Computer Weekly, p26(1)
Dec 12, 1991
ISSN: 0010-4787 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1305 LINE COUNT: 00108

ABSTRACT: Computer-Aided Software Engineering (CASE) tools can help cut a
company's software development costs by increasing the company's
productivity. According to GEC-Plessey Telecommunications (GPT), this
increase comes from automating the process of diagramming specifications;

automating the work of balancing a full analysis model; improving the speed and accuracy of design production with an intuitive user interface; providing clearly defined interfaces between project elements; and
simplifying programming from high-quality design specifications. CASE tools

also reduce development lifecycle time by 30 percent to 50 percent, improve the quality of the end product and improve business by delivering products
on-time and within budget. The end result is improved flow of revenue.

TEXT:

Companies wishing to measure the return on investments in computer-aided systems engineering (Case) have usually found themselves at
a loss.

In its early days, Case raised companies' expectations unrealistically with Case vendors overselling the technology as the miracle cure-all for
the ills of the software development industry. But as the dust settles, it
is now possible to evaluate the deliverable benefits of this technology in
terms of quality and productivity.

To get a true picture of the actual return, the payback can be isolated as cost savings and new revenue generated, as users have
discovered.

Throughout the development lifecycle, cost savings can be made using
Case tools that directly increase the productive output of a project team.

GEC-Plessey Telecommunications (GPT), for example, compared two
similar projects involving 200,000 lines of code. Using the Teamwork Case
development environment, the company succeeded in having total development
time using a project team half the size.

In Japan, Yokogawa-Hewlett-Packard quotes a 63% improvement in productivity between one team using Case tools and another using manual
methods.
*** The productivity gains can be attributed to five factors.***
*** * Specification modification. Companies who don't use Case methods***
often employ a dedicated diagramming group to produce specifications.
Manually this process can take weeks, documents can be inaccurate and are
often out of synchronisation with the design itself. For GPT this was a
major justification for adopting Case.
*** * Checking. GPT believes that prior to introducing Case it took four***
working months to balance a full analysis model, with the associated
possibility of introducing human error. By comparison, in a Case
environment, a check can be run in minutes. This encourages regular use. As

a result, errors are detected significantly earlier.
*** * Design process. Where companies have received Case training and are***

using a Case product with an intuitive user interface, the speed and
accuracy of design production can be improved dramatically.

In some cases a software engineer can be productive within 30 to 60
minutes. Just as important, using Case it becomes easier to impose a single

formal design method on the whole project team.
*** * Design visibility. Case tools provide all members of the project***
team with clearly defined interfaces between project elements. Information
on related elements is easy to access. As an additional benefit, this
increases the confidence of the end-user because it is possible to show a
design prior to delivery.
*** * Code generation. With a good design, coding should be less than 5%***
of the total effort. Programming from a high quality design specification
can be performed by a less skilled project member in less time, and it is
easier to measure code quality.

Generating code can be further simplified using projects such as the C Source Builder, the Ada Design Sensitive Editor and the OOD C++ code
generator.

Much time is often wasted on software projects in rectifying errors

that arose earlier in the development process. Catching these errors before

they get too far reduces rework time.

When introducing Case technology, Siemens-Stromberg-Carlson quoted a
defects density of below one per 1,000 lines of non-commented source code.
On one 40,000-lines-of-code project, the company estimates it pre-empted 72 defects, which represents an estimated 30,000 pounds saving in terms of
employee hours.

Savings like these can be made by regularly checking code against specifications and the data dictionary, enabling problems and errors to be
highlighted early.

In addition, tools such as Teamwork/RqT and Marconi Underwater Systems+ RTM, provide the project manager with high visibility which subsequently reduces the likelihood of misinterpreted statements of
requirement or project specifications.

When assessing the relationship between software processes and hardware processors, the project team has an additional advantage because
it can verify designs at an early stage through simulation. Case can be
used to animate analysis specifications, which allows a developer to verify
behaviour prior to coding. Again this cuts costs by reducing future rework.

*** Significant effort is frequently spent on project administration.***
Case tools reduce the amount of time spent on administrative functions. By
using configuration management tools it becomes feasible to easily synchronise the project specification through a reduction in administration
analysis, design, code and tests phases.

To maximise the return from Case technology and ensure that companies investing in Case don't spend all their time configuring their own
environments, the tools must be able to interface simply.

To minimise the investment risk of being tied to a single workstation vendor it is important that these tools have an open architecture to run on
multiple workstation platforms.

Full project documentation frequently has to conform to documentation
standards. This involves generating textual descriptions to elaborate on
the design, and the design process, to ensure the software can be
maintained in the future.

Introducing a desktop publishing system, such as Interleaf TPS, means the system can be documented online with a transparent interface to the
Case project.

Project specifications may change during the development process, which means that the impact of change needs to be analysed throughout the
project. Manually, this is an impossible task. By using Case technology, a
company can trace the impact through a system.
*** Some products have an in-built "where referenced" function. It can***
identify all the specifications that may be affected by a particular piece
of data or function.

Reverse engineering tools, such as Slice, can save the project team weeks of effort by identifying which code elements are responsible for
performing a particular function, before forward engineering is resumed.

Then there are some Case tools, such as Testcase, **that can**
perform test case generation directly from the analysis specifications.
Time can be saved in defining the tests against which the final project can
be shown to meet user requirements.

Comparing projects before and after Case implementation, McDonnell Aircraft quotes an estimated 50% reduction in the test and integration time
on a project when compared to its pre-Case experiences.

Case os often adopted to reduce costs on an enhancement engineering
project rather than for new software development. Case tools like McCabe
support the reverse engineering process. They aim to reduce the effor
involved in analysing existing source code prior to forward engineering.

These tools are capable of analysing tens of thousands of lines of
code in minutes; a task that could tie a team of engineers up for months.

The cost savings identified earlier tend to be the main focus for
companies initially. In reality, by far the greatest argument for adopting
Case comes from the revenue improvements a company can achieve.
Revenue flows can be improved on three accounts:
*** * Faster time to market. Some developers using Case tools quote a 30%***

to 50% reduction in their development lifecycle. As a result, their
products reach customers more quickly, giving a faster payback on
investment.
*** * Premium price quality products. Case technology improves the***
quality of the engineering process. The Software Engineering Institute,
part of Carnegie-Melon University, has identified that almost invariably, the quality of the end product is directly proportional to the quality of
the process that produced it.
*** * Repeat business. Not all organisations need to bring products to***
market faster than the competition. Many prefer to focus on delivering on
time, within budget and to specification.
*** Case helps companies meet this business goal. Building customer***
loyalty and winning new business by referrals allows companies to improve
revenue flows in the longer term.
Richard Campbell works on Case consultancy management with
Marlow-based Intrumatic.

SPECIAL FEATURES: illustration; photograph
INDUSTRY CODES/NAMES: CMPT Computers and Office Automation
DESCRIPTORS: Computer-aided software engineering--Usage; Software engineering--Products
FILE SEGMENT: CD File 275

6/9/131 (Item 17 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05184512 SUPPLIER NUMBER: 10863526 (THIS IS THE FULL TEXT)
Cadre adds testing tool to CASE line. (Cadre Technologies Inc.'s Teamwork/
TestCase **computer-aided software engineering package) (product announcement)**
Pallatto, John
PC Week, v8, n24, p61(2)
June 17, 1991
DOCUMENT TYPE: product announcement ISSN: 0740-1604 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 449 LINE COUNT: 00036

ABSTRACT: Cadre Technologies Inc introduces its Teamwork/TestCase **software testing package for its Teamwork computer-aided software**
engineering product line. *** TestCase *** allows programmers to rapidly
generate testing routines for debugging applications. The package is based
on Programming Environments Inc's T test-case-generation system. The
software allows users to check data-flow diagrams developed under Teamwork.

Cadre officials estimate that the package reduces test-case building time
by up to 60 percent. The $9,995 software package runs on Sun Microsystems
Inc SPARCstations and Sun-3 computers as well as IBM's RS/6000 and HP's
HP-UX workstations.
TEXT:
By John Pallatto
*** Cadre Technologies Inc. has accelerated the production of software***
testing routines by as much as 60 percent by integrating a widely used test-generation tool with its Teamwork CASE product line, according to

developers who have worked with the tool.

Teamwork/TestCase, **which will run on Unix workstations, automates what is usually a labor-intensive, time-consuming process: writing custom testing routines to ferret out bugs in software, said William Sundermeier,** TestCase **product manager for Cadre in Beaverton,**
Ore.

Cadre's TestCase **is based on T, a test-case-generation system**
developed by Programming Environments Inc. (PEI), a privately held
software-development firm in Tinton Falls, N.J., Sundermeier said. PEI and **Cadre have signed a joint development and marketing agreement that allows**
Cadre to sell T with the other Teamwork CASE products, he said.

T has been tightly integrated with other Teamwork CASE tools by allowing developers to build test cases to check Teamwork data-flow diagrams, according to veteran T user Darl Patrick, a senior technical
staff member with Sandia National Laboratories in Albuquerque, N.M.

"In the past, once we had developed a data-flow diagram, we had to manually input all that data into T to generate test cases that would check
the diagram design," Patrick said. "With this interface between Teamwork **and** TestCase, **you can play a lot of `what-if' games by changing the**
diagram to see how it changes the test cases."

By integrating T with the Teamwork tools, "Cadre has reduced by 50 to
60 percent the amount of work necessary to build test cases," he added.

Teamwork/TestCase, **priced at $9,995, will be sold by Cadre**
directly and through its distributor network, Sundermeier said.
****** TestCase *** will be shipped for Sun Microsystems Inc. SPARCstations in***
August and for Sun-3, IBM RS/6000 and Hewlett-Packard Co. HP-UX
workstations by the end of the year, he said.

Automating the generation of test cases produces routines that are
tailored for a new software design, according to Patrick. This factor helps

developers find a larger proportion of bugs in a program, he said. During **an 18-month period, users reported only two program errors in applications that had been tested with routines generated by T, as opposed to 70 errors in applications tested with routines generated through manual methods, he**
added.

Cadre Technologies, a privately held company, currently supports 15,000 worldwide installations of its Teamwork family of products, which consists of 16 separate CASE tools for structural analysis, design, code
generation, reverse engineering and testing. The firm can be reached at
(401) 351-5950.

*** COMPANY NAMES: Cadre Technologies Inc.--Product introduction***
INDUSTRY CODES/NAMES: CMPT Computers and Office Automation
DESCRIPTORS: Computer-aided software engineering--Computer programs; Program development software--Product introduction; Computer software industry--Product introduction
SIC CODES: 7372 Prepackaged software
TRADE NAMES: Teamwork/TestCase **(CASE software)--Product introduction**
OPERATING PLATFORM: Sun SPARCstation; Sun-3; IBM RS/6000
FILE SEGMENT: CD File 275

6/9/132 (Item 18 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05062155 SUPPLIER NUMBER: 10882576
Unix software products redefined. (Interactive Development Environments, **Cadre Technologies introduce new system components)**

Ambrosio, Johanna
Computerworld, v25, n24, p34(1)
June 17, 1991
ISSN: 0010-4841 LANGUAGE: ENGLISH RECORD TYPE: ABSTRACT

ABSTRACT: Interactive Development Environments (IDE) Inc and Cadre Technologies Inc have announced key enhancements to their respective Unix ***program development toolkits. IDE has added reverse engineering and code*** generation capabilities to its C Development Environment, initially ***released in Sep 1990. The product now allows users to develop code at their*** own pace and allows existing source code to be converted into designs from ***which new, improved source code is generated. Cadre now offers a tool that*** ***produces automated test cases as part of its Teamwork development system.*** Officials note that the testing phase is often ignored in development life ***cycles and that many development shops do not enforce quality standards.*** The Testcase component of Teamwork is based on Programming Environments Inc's T tool and lets users produce test cases for modules under development as well as integration between modules and the entire ***system.***

*** COMPANY NAMES: Interactive Development Environments Inc.--Product*** *** enhancement; Cadre Technologies Inc.--Product enhancement***
INDUSTRY CODES/NAMES: CMPT Computers and Office Automation
DESCRIPTORS: Unix--Computer programs; Program development software--Product enhancement; Computer software industry--Product enhancement
SIC CODES: 7372 Prepackaged software
TRADE NAMES: Interactive Development Environments C Development Environment (Program development software)--Product enhancement; Teamwork (CASE software)--Product enhancement
FILE SEGMENT: CD File 275

6/9/133 (Item 19 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

04541552 SUPPLIER NUMBER: 08264158 (THIS IS THE FULL TEXT)
Focus: GPIB control software. (general purpose interface bus)
Novellino, John
Electronic Design, v38, n4, p159(7)
Feb 22, 1990
ISSN: 0013-4872 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 3490 LINE COUNT: 00286

ABSTRACT: The general purpose interface bus (GPIB), a result of IEEE Standard 488, is a useful tool for test and measurement engineers but ***requires programming to take full advantage of its functions. GPIB*** instrument control software is available in a variety of levels and capabilities, allowing engineers to select the product best fitted to their ***particular application and level of expertise. Prices range from less than*** ***$1,000 to almost $10,000. Guidelines for making a selection are presented*** and GPIB control software products from some 15 vendors are briefly ***reviewed.***

TEXT:

FOCUS GPIB CONTROL SOFTWARE Since its birth in 1975 as IEEE Standard 488, the general purpose interface bus (GPIB) has been a workhorse for test ***and measurement engineers. But as useful and important a tool as the GPIB*** is, it can still be difficult to work with, primarily because of the ***programming needed to take full advantage of the bus' functions.*** Fortunately, numerous software packages introduced over the last few years

make programming a gpib Test setup much easier. Because of the GPIB'S
popularity--and the notion that less programming is better--new packages
and enhanced versions of old standards continue to be unveiled.

The advantage of the GPIB control packages is that they relieve
engineers of the low-level instrument control task. Depending on the level
of sophistication, a package can permit high-level programming commands,
supply instrument and function libraries, and perform graphical and
mathematical analysis on the acquired measurements.

Although the IEEE-488 standard does a good job in defining hardware,
instrument manufacturers are mainly on their own when it comes to software.

Consequently, a programming problem arises from the lack of consistency in
codes, data formats, internal timings, and status-code responses among GPIB
instruments. To sort out this Tower of Babel, engineers doing the
programming must pore over each instrument manual to learn how to
communicate with the boxes they want to use.

The problem is compounded by the varying levels of software support
supplied by instrument manufacturers. Some manufacturers supply driver
software in several languages, while others offer only sample commands or
code fragments. And the drivers, when supplied, are command oriented rather

than function oriented. As a result, test programmers must learn the
instrument's command set before creating test procedures.

GPIB instrument control software is also available in a wide variety
of levels and capabilities. This diversity offers test engineers the
advantage of choosing the specific product that fits their level of
programming expertise and the needs of their application. Of course, this
freedom of choice comes with the task of evaluating the available products
for their suitability. With a price range from under $1000 to nearly
$10,000, and the inherent difficulty in comparing software, the job can be
a tough one.

To help in the selection process, the packages can be broken down
into categories in at least two ways. One way considers the prospective
user and his or her expertise. The other involves the operator interface.

Using the first criterion, Bill Kolegraff, product manager for
Wavetek's WaveTest software, splits the field into two parts. The first
includes tools aimed at helping software engineers write their programs
faster. "The second is what I call procedure generators," says Kolegraff.
"They do test procedures without actually generating code. These programs
enable test engineers to create procedures without the need to have
programming knowledge."

Although the choice of product then revolves primarily around who
will be setting up the test, the application is also a consideration.
While there aren't necessarily limits on what procedures generators can do,
they're better suited for test engineering or low-volume production work.
They're less useful in applications where speed is important, such as
high-volume production testing and real-time control of processes.

Stated the other way, instrument control software can be divided
between programming-oriented and menu-driven packages. Programming packages

require users to enter commands, although they may be high-level
English-language commands. With menu-driven packages, users can pull
commands and functions from menus or a series of icons; they usually don't
present a list of code as an end product. The're also easier to use, often
requiring no programming experience. Functionality, however, may be
limited.

"Successful use of IEEE-488 requires a great amount of flexibility,"
says Ray Almgren, product manager for National Instruments' LabWindows. "In

the past, menu-driven packages haven't had that kind of flexibility.
They're typically not as flexible as programming-oriented packages."

Unless they' e part of a full-blown programming language, icons may

not offer users all of the functions they need, says Almgren. For instance,

test routines may need the ability to loop, check for errors, and make
branching decisions. The only icon-based package that supplies a full
programming langauge is National's LabView software for the Macintosh,
according to Almgren.

By employing a programming-oriented package that supplies code, the
operator can easily customize the test program for different applications.
If the code is compiled or can be compiled with a standard langauge
compiler, the program isn't restricted to a one run-time environment. In
addition, a compiled program has less overhead than a program that's part
of an interactive environment, so it will run faster.

CONSIDER THE CODE

Users should consider not only how the code is generated, but what
code results from the effort. If a package uses a proprietary code, it may
be difficult to modify and be incompatible with users' existing programs,
notes Bethann Stolte, product manager for Hewlett-Packard's line of gpib
software. Furthermore, a proprietary code may not have all of the features
of a popular language, such as C or Basic, and could run out of power at a
crucial point.

Another factor users should consider is the library of instrument
drivers available with the software package and the fact that drivers can
differ in ability. The most complete, high-level instrument drivers
generally are only available for a company's own instruments, according to
Jean-Louis Steevensz of Philips Test and Measurement. These drivers use
logical addressing, which makes it possible for similar instruments to be
exchanged without rewriting the application program. Philips, in a
strategic partnership with John Fluke Mfg. Co., markets the TestTeam GPIB
software package.

If an instrument manufacturer does supply drivers for other
manufacturers' instruments, the drivers may offer only a subset of the
equipment's functions. Consequently, users should ensure that the drivers
contain all of the needed functions, which normally include write, clear,
trigger, status, and serial poll, as wel as the most commonly used
instrument functions.

Users may still have to write low-level routines to talk to
instruments not in the driver library. The software should help out by
letting users combine often-used routines into function panels that make
high-level calls to the drivers. The package should show a generic panel on

the screen and make it possible for users to modify it for the instrument
needed, or panels from ready-made drivers should be able to be copied and
modified. Most important, says Steeensz, users should have the ability to
assign logical names to the instrument and define high-level commands that
can be called by the application program.

The growing popularity of GPIB control software is evidenced by the
many recent introductions of new or enhanced packages. In addition to
increased performance features, trends include the addition of VXI-bus
support and the porting of software to different operating environments.
Last month alone, six such upgraded or new packages debuted.

National Instruments added a graphical language compiler to LabView
2.0, the latest version of its Macintosh software, which was scheduled to
ship in late January. The previous edition had to interpret the graphical
program that it created as the program ran (Fig. 1). But the compiler in
LabView 2.0 generates machine code from the block diagram, so that the
interpretation isn't needed. As a result, I/O-intensive applications run
about three times faster, and computation-intensive benchmarks run as much
as 60 times faster, says National. A number of other enhancements were
added, including complete clipboard cut-and-paste capability, color and
gray-scale support, graphs, and strip charts with scroll bars. The package
costs $1995, but upgrades from earlier versions are free.
*** Last fall, National upgraded its MS-DOS package--LabWindows. The new***

version, 1.2, features scrolling or redrawing strip charts and numeric
ports, which display continuously updated measured data. The software also
has comprehensive run-time error detection and protection. Twenty
instrument driver modules were added, bringing the library to more than 75
GPIB and RS-232/422/485 models. With its instrument, data acquisition, and
analysis libraries, LabWindows helps users develop applications programs in
Microsoft C and QuickBasic.
*** Also in January, Wavetek San Diego Inc. added VXIbus capability to***
its icon-based programming environment, WaveTest. Called WaveTest/VXI, the
package eliminates the need to understand the VXIbus protocols,
automatically generating test programs from user-created flow-charts or
modules. The interface creates front panel displays through which the
operator can control VXI instruments. Wavetek says it will characterize VXI

instruments as they become available, adding them to the package's GPIB
library of more than 100 devices.
*** Last year, Wavetek introduced WaveTest Version 2.5, which increased***
the allowable program size from 150 kbytes to 2 Mbytes. Another
enhancement, called import and link, enables users to create subprograms
and templates once and then copy (import) or merge (link) them into new
programs. Version 2.5 has a function key interrupt feature through which
any of the function keys can be programmed by the user. WaveTest runs on
IBM PC/ATs and compatibles, and the VXI version can use the embedded PCs
offered by Radix Microsystems and Colorado Data Systems. The package costs
$3990, and includes an interface card and Windows.

NEW DOS VERSION

Last month Hewlett-Packard also added a new version to its instrument
control package, the HP Interactive Test Generator. HP ITG/DOS--which works

on HP Vectra PCs, PC/ATs, and compatibles running MS-DOS--uss on-screen
instrument panels and mouse-selected settings to speed test program
development (Fig. 2). The new software automatically writes code in
Microsoft C, QuickC, and QuickBasic. The original HP ITG generates HP Basic

code, which runs on a Vectra PC, an IBM PC/AT, or compatible using the HP
Basic language processor.

Engineers using ITG/DOS needn't know specific instrument mnemonics,
which are supplied by a library of drivers for 66 HP-IB (GPIB) and VXIbus
instruments. Moreover, the program statements that are generated don't
contain specific mnemonics, only commands that access the drivers. As a
result, instruments in the test system can be replaced with only minor
changes in the test program. To eliminate unnecessary bus traffic, ITG/DOS
tracks the current instrument state and sends only the commands needed to
reach the next state. This feature significantly increases throughput. HP
ITG/DOS and the instrument library cost $1,495; with an HP-IB interface
card it costs $1995.

Another new package available to IBM PC users is WorkBench PC from
the Telesensory Software division of Strawberry Tree Inc. Scheduled for
shipment this month, the product follows its earlier sibling, WorkBench
Mac, a Macintosh version. The automatic program generator features 14 icons

representing such functions as GPIB devices, analog and digital inputs,
calculations, and logic. Users set up the test system by "wiring" together
the needed icons on the screen (ELECTRONIC DESIGN, Jan. 11, p. 218).

WorkBench PC works with GPIB interface boards from Strawberry Tree,
IOtech, and Metrabyte. Along with the Personal488 board from Strawberry
Tree, users get Driver488, a DOS-installable device driver for the PC.
Combined with WorkBench PC, the board and driver make it possible for users
to control up to 14 GPIB instruments from a number of popular languages,
including QuickBasic, Turbo Pascal, and Fortran. WorkBench PC goes for
$995.

Also available for the first time in January was SuperScope, a data

acquisition and analysis software package from GW Instruments (ELECTRONIC
DESIGN, Feb. 8, p. 125). SuperScope, which works with Macintosh II, IIx,
IIcx, IIci, or SE computers, takes data inputs and creates real-time
oscilloscope, XY recorder, strip chart recorder, and spectrum analyzer
presentations. The virtual instrument functions are programmed using
dialogue boxes and menus. GPIB instruments are supported by the MacADIOS
488n and 488s I/O interfaces and MacDA488, a Macintosh desk accessory that
creates command sequences. The package is priced at $990.
*** From Capital Equipment Corp. comes a package called Co-Operator,***
which creates fully commented and ready-to-run GPIB control code in Basic,
Turbo Pascal, Microsoft C, Turbo C, or Fortran. Introduced last month, the
software works with all popular program editors, popping up over the editor
screen. It also works with any word-processor software. To add instrument
control code to the program, the user chooses the function, library, or
application template. The instrument settings are then selected using a
front-panel display of the chosen device. When the settings are correct,
the user drops Co-Operator from the screen, positions the cursor where the
control code is needed, and presses one key to enter the code.

The application templates are complete subroutines for common
applications, and users can customize them for their own operation.
Co-Operator works with all IBM PCs and compatibles and is available
immediately for $249.

Tektronix' latest entry into the instrument control field aims at
both GPIB and VXIbus equipment. Introduced last summer, TekTMS (Test
Management System) consists of the Interactive Program Generator and two
libraries of GPIB and VXIbus instrument panels. The system is based on
industry standards, using an IBM PC/AT or compatible, MS-DOS, and Microsoft
Windows.

Users create test steps and control instruments with the software
front panels, which contain icons that represent individual controls.
Multiple front panels can be selected and displayed as separate windows.
They can be moved, sized, and reduced to icons when not needed. TekTMS
displays the test steps on a Test Outline View in a scrollable window (Fig.

3). Pop-up dialogue boxes make it possible for users to view and edit the
details of each step.

Test engineers can add instruments to the front-panel libraries with
the aid of the Instrument Script Language, which defines the placement and
types of front-panel controls and their linkage with instrument-specific
commands. Moreover, Tektronix lets VXIbus instrument manufacturers develop
TekTMS instrument drivers under license. The licensees then market the
entire package. The first agreements were made with Analogic, Colorado Data

Systems, and Racal-Dana Instruments. The Interactive Procedure Generator
costs $2500, and each instrument library goes for $495.

One of the more popular data-acquisition, analysis, and graphics
packages gained GPIB capability last fall when Laboratory Technologies
Corp. introduced the GPIB Support Kit for its Labtech Notebook. Controlling

up to 31 instruments at once, the GPIB Support Kit includes command setups
for units from Fluke, Hewlett-Packard, Keithley, Tektronix, and Wavetek.
Labtech Notebook comes in both IBM PC and Macintosh versions.

The package features a utility that operates within the software's
menu system. Three windows are used: One displays the GPIB commands that
are available, another allows entry of commands, and the third immediately
shows results as users enter commands. This operation is in direct contrast

with programming approaches to test development in which a complete,
executable program must be created before any of the GPIB commands can be
tested.

In another recent development, the company ported Labtech Notebook to
Digital Equipment Corp.'s Unix-based RISC workstations, the DECstation 2100

and 3100. As an add-on, the GPIB Support Kit costs $295. Bundled with
Labtech Notebook, the package costs $1195 for the PC version and $995 for
the Macintosh version. The DEC version is priced at $2000 and is scheduled
to begin shipping by next month.

Another data-analysis software package received GPIB capability with the introduction of DADisP-488, an MS-DOS device driver module for DSP
Development Corp.'s DADisP Worksheet. The driver translates user-specified
high-level instrument commands into low-level IEEE-488 bus signals.
Available are more than 30 GPIB functions called by commands similar to
those used by HP Basic. The module, which handles input and output ASCII or

binary data transfers, works with GPIB interface boards from several
manufacturers. In fact, National Instruments recently began offering DADisP

Worksheet as an option to boards for the IBM PC/XT/AT, PS/2, and
compatibles; and the Sun-3, -4, and 386i workstations.

DADisP is a menu-driven software package that needs no programming to display and manipulate data, including tables, signals, waveforms, and text
(Fig. 4). Using a speadsheet-like interface, operators can run numerous
analysis routines on the acquired data. Besides mathematical routines,
users can perform fast Fourier transforms, convolutions, digital filtering,
waterfall plots, three-dimensional plots, and other operations. DADisP is
available for all IBM-compatible 80286 and 80386 computers for $1695.
Versions for Concurrent, Digital Equipment, Hewlett-Packard, and Sun
Microsystems workstations start at $2995. DADisP-488 goes for $195.
*** Keithley Asyst (formerly Asyst Software Technologies Inc.) last year***
introduced Asyst 3.0, a significantly enhanced version of the company's
data-acquisition, analysis, and graphics package. The upgrade was aimed at
making the software easier to learn and more efficient to use. Asyst, which

runs on the IBM PC/XT/AT and PS/2 and compatibles, works with GPIB interface boards from most major suppliers and numerous data-acquisition
boards. Users can call up functions from a set of high-level, flexible
English-based commands.
*** Improvements in Asyst 3.0 include Easy Coder--a series of menus that***
prompt users for parameters and generate code for common operations--and
built-in mouse support. In addition, the Documentation Starter Kit leads
new users through the system's basic functions, using a quick reference
guide of all Asyst words listed alphabetically and by function. With new
menu-building tools, users can create menus that call other menus and data,
run custom macros, do status checks, or display directories. The new
version includes a DOS shell and language interface for accessing external
Microsoft C and Fortran programs. Asyst 3.0 costs $1695.

Pop-up windows and pull-down menus make it easy to generate application programs in C, QuickBasic, BasicA, GW Basic, or Pascal with the
Fluke/Philips TestTeam software package. TestTeam includes specific
instrument drivers for numerous Fluke and Philips products, as well as
units from other manufacturers. With an optional instrument library for the

desired programming language, TestTeam will output source code-files that
can be compiled for execution in external applications.

AUTOMATIC CONFIGURATION

*** An auto-configuration utility sets up the entire test system. The***
user types in "Config" and the program identifies the instruments connected
and their addresses. It then assigns user-defined names. To operate the
instruments, the user enters settings in on-screen function panels.
Graphics and analysis functions can also be called up from libraries by
filling in similar panels. Built-in facilities check syntax and
interactively debug test programs. The package costs $995, and the required

GPIB interface card costs $399 for the PC or $499 for the PS/2.

For applications involving functional testing--including board,

mixed-signal, high-speed digital, and final system testing--GPIB instrument
control is integrated into the *** TestCASE *** package from Summation Inc.
TestCASE is a suite of computer-aided software engineering tools that cover the entire functional test process, from requirements analysis
through results analysis. The recommended configuration is a DOS-compatible

80386-based computer with 3 Mbytes of RAM and a 20-Mbyte or larger hard
disk.
With the software's IEEE-488 window, users can send commands and data
directly over the bus. Instrument setup is done through one of the hundreds

of windows supplied for individual instruments. The point-and-click
interfaces use vendor-defined commands so everything is in plain English
(Fig. 5). *** TestCASE *** generates the correct GPIB code and places it in
the application program in the location specified by the user. Additional
windows can be created with the IEEE-488 Window Editor/Generator.
Other elements of TestCASE include the TestBasic language,
libraries of reusable program templates, and the Revision Control System.
Derived from the standard Basic language, TestBasic is optimized for
developing test programs. The templates are code segments that can be
imported into an application program and modified if needed. The Revision
Control System helps users track and control their files.
CAPTIONS: Suppliers of GPIB instrument control software. (table)

SPECIAL FEATURES: illustration; table
INDUSTRY CODES/NAMES: ELEC Electronics; CMPT Computers and Office Automation
DESCRIPTORS: Institute of Electrical and Electronics Engineers--Standards ; Buses (Computers)--Computer programs; Software--Design and construction
SIC CODES: 7372 Prepackaged software
FILE SEGMENT: TI File 148

6/9/134 (Item 20 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

03883538 SUPPLIER NUMBER: 07076336 (THIS IS THE FULL TEXT)
Functional-ATE software integrates CASE tools. (automatic test equipment,
computer-assisted software engineering) (product announcement)
Maliniak, David
Electronic Design, v37, n2, p151(1)
Jan 26, 1989
DOCUMENT TYPE: product announcement ISSN: 0013-4872 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 552 LINE COUNT: 00047

ABSTRACT: Summation Inc's TestCASE is the first microcomputer-based functional-ATE (automated test equipment) software environment to include
integrated computer-aided software (CASE) tools. *** TestCASE *** contains
enhanced features from the company's TestWindows ATE software including: the Microsoft Windows graphical user interface, virtual front-panel windows for interactive control of Sigma Series, IEEE-488, and VXIbus instruments,
and the structured TestBASIC language. The *** TestCASE *** ATE software
costs $5,995.

TEXT:
FUNCTIONAL-ATE SOFTWARE INTEGRATES CASE TOOLS DAVID MALINIAK

As functional test grows in popularity, test engineers are faced with ***the challenge of developing complex test programs. The cost of developing*** ***such programs becomes the limiting factor in test-automation efforts. Now,*** the first PC-based functional-ATE software environment to include integrated computer-aided software-development (CASEe tools has arrived in ***Summation's *** TestCASE *** package.***

The TestCASE package contains enhanced features from, and is ***upwardly compatible with, the company's TestWindows ATE software. These*** features include the Microsoft Windows graphical user interface, virtual front-panel windows for interactive control of SigmaSeries, IEEE-488, and ***VXIbus instruments, and the structured TestBASIC language.***

With the package's front-end tools, much of the process of getting ***from test specification to an executable test program is automated. These*** tools are centered around the concept of code templates, which are files that may contain as little as a few lines of code or as much as multiple ***subroutines. Front-end tools include the TestPlan Generator, the Template*** ***Editor and librarires, the TestBASIC editor, and the TestVector Generator.***

The TestPlan Generator tool creates a program shell complete with operator interface, event-servicing routines, control structures, and ***result handlers. TestSteps, based on the test specification, are created by***

the user within the shell or may be loaded directly from a file. The TestCASE software then expands each TestStep into a completely structured subroutine into which instrument set-ups and templates may be ***imported. Importing a set-up from an instrument window automatically*** ***generates the test-program code to recreate that set-up at run time.*** *** The package is supplied with a fully documented library of templates.***

The Template Editor, however, enables users to create their own custom ***templates. A Browse function helps designers find appropriate templates for***

their specific applications.

The test-vector-generation tools include the Digital Stimulus and Response (DSR) Pattern Editor, the DSR Comparison Editor, and CAE Link ***tools. The DSR editors let users generate and compare test vectors, while*** the CAE Link tool permits the downloading and translating of CAE-simulation ***files.***

Back-end tools include, among others, a comprehensive debugging environment, a performance-profiling tool, and a documentation-revision ***control system. The on-line, interactive debugging environment permits a*** ***wide range of trace and complex-break conditions. The profiler collects*** program-performance statistics and then displays histograms of the test-program performance, which helps to focus optimization efforts where ***they are needed.***

The revision-control system maintains software integrity and retains ***a history of development. The file-locking scheme prevents file corruption*** ***from concurrent edits and other activities.***

In the resource manager, users gain a graphical menu system that ***provides feasy access to any element in the *** TestCASE *** environment. It*** resides at the top of the environment to organize and manage TestCASE tools, template libraries, test programs, graphic elements, data files, and ***Windows applications.***

The TestCASE ATE software costs $5995 and is scheduled for ***delivery in March. Multiple-copy discounts and site licensing are*** ***available, as is an upgrade for registered TestWindows users.*** *** Summation Inc., 11335 N.E. 122nd Way, Kirkland, WA 98034; (206)*** ***823-8688.***

CAPTIONS: Highly integrated tools. (chart)

SPECIAL FEATURES: illustration; chart

*** COMPANY NAMES: Summation Inc.--Product introduction***
INDUSTRY CODES/NAMES: ELEC Electronics; CMPT Computers and Office Automation
DESCRIPTORS: Automatic test equipment--Computer programs; Computer-aided software engineering--Computer programs
SIC CODES: 7372 Prepackaged software
TRADE NAMES: TestCASE **(Program development software)--Product introduction**
FILE SEGMENT: TI File 148

also developed CoSolve-EM, a coupled electro-mechanical solver that is an
integral part of the MEMCAD 2.0 system.

CAD Partnership Program

Microcosm will seek out additional companies to join its CAD Partnership Program that require advanced software tools to design and
analyze MEMS devices for the next generation of applications. These
applications include medical equipment, automotive products, computer disk drives, telecommunications, energy management and control systems, and
displays. Mr. Jamiolkowski added that, "Our MEMS software will make a huge
difference to systems designers because costly and time consuming
experiment design cycles can be reduced by computer modeling and analysis.
Microcosm's CAD software allows for alternative multiple design spaces to
be explored without tedious experimentation."

Microcosm's first software products will address 3D visualization of devices from mask and process input, general structural analysis, electromechanical analysis for capacitance-based sensors (accelerometers, gyros, and pressure sensors), and electromechanical analysis for
electrostatic actuation (valves, and force-balanced sensors). The company
will add system level technology by late 1996 for higher level modeling of
MEMS devices with their electronic counterparts.

Company Background

Microcosm Technologies was established in 1995 to develop and market MEMS CAD software with solutions for device design, manufacturing analysis
and system integration. The company provides state-of-the-art software
tools to design mechanical microstructures, microsensors, microactuators, and electronics integrated in the same environment -- on the silicon chip
or in the device package. Microcosm will support MEMS companies that
require better design automation software to accelerate the development of
MEMS devices and systems through manufacture. Microcosm is financed through

private investment.

For further information about Microcosm Technologies, contact Mike
Jamiolkowski at 919-677-9272 in Raleigh, NC.

-0- 1/24/96

*** /CONTACT: Mike Jamiolkowski, President, Microcosm Technologies Inc.,***
919-677-9272, or Chris Burke, BtB Marketing Communications, 919-872-8172/
(TXN)

*** CO: Microcosm Technologies Inc.; MIT; Ford Microelectronics; Texas***
Instruments ST: North Carolina IN: CPR SU: PDT
JB -- CHW010 -- 4740 01/24/96 13:03 EST

*** COMPANY NAMES: Microcosm Technologies Inc.--Product development; Ford***
*** Motor Microelectronics Inc.--Contracts; Texas Instruments Inc.--Contracts***

INDUSTRY CODES/NAMES: BUS Business, General
DESCRIPTORS: Computer software industry--Product development
PRODUCT/INDUSTRY NAMES: 7372000 (Computer Software)
SIC CODES: 7372 Prepackaged software
TICKER SYMBOLS: TXN
FILE SEGMENT: NW File 649

6/9/126 (Item 12 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

08057042 SUPPLIER NUMBER: 17135061 (THIS IS THE FULL TEXT)
Segue Software's QA Partner 3.0 eases cross-platform GUI testing. (Software

Review) (Evaluation)
Gallagher, Bob